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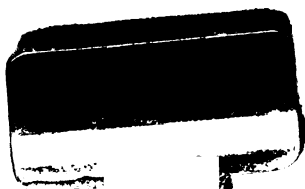
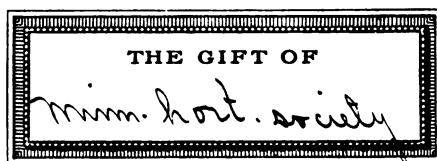
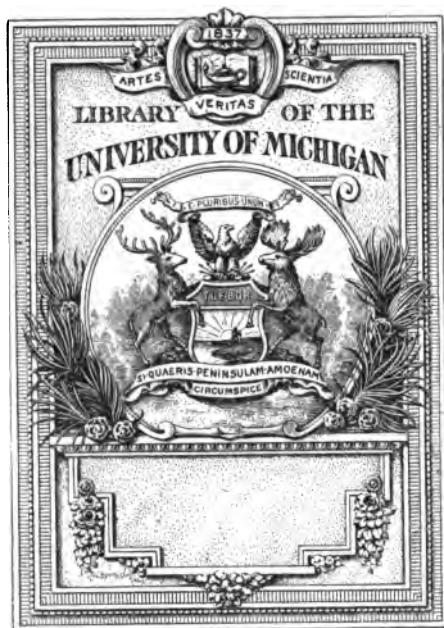
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ANNUAL REPORT
OF THE
MINNESOTA
STATE HORTICULTURAL SOCIETY

For the Year 1883,

EMBRACING THE

Transactions of the Society from the Close of the Annual Meeting in
1882 to the 7th of March, 1883.

PROCEEDINGS, ESSAYS, DISCUSSIONS AND REPORTS.

Compiled and Edited by the Secretary, Oliver Gibbs, Jr., Lake City, Minn.

MINNEAPOLIS:
JOHNSON, SMITH & HARRISON.
1883.

Minnesota State Horticultural Society.

SECRETARY'S OFFICE,
LAKE CITY, March 7th, 1883. }

Hon. L. F. Hubbard, Governor of Minnesota.

SIR:—Under the requirements of an act passed at the recent session of the Legislature, I herewith transmit to you the annual report of this Society, embracing its transactions from the close of the annual meeting in January, 1882, to the present date.

As this is the first occasion when our report has been formally transmitted to the Governor, it seems proper to invite your attention to some special features of our work. While we are engaged in the promotion of Horticulture in all its branches, our chief attention at present is paid to the development of the fruit interest. In this we aim—

First, to encourage the people to plant freely and cultivate intelligently such fruits as are known to be or likely to be successful in the present conditions of our soil and climate;

Second, to stimulate the planting of forests and shelter belts for the amelioration of climate; and,

Third, to introduce new varieties by importation from foreign countries, where the summers and winters and other conditions are like our own, and by the systematic production and cross-breeding of seedlings from the hardiest and best sorts we now have.

Your attention is especially invited to the two lines of advancement mentioned in the last clause of the preceding paragraph, as

it is on these lines that we are mainly dependent upon the aid received from the State, and that we may continue to have the hearty co-operation of the State, we hope our plans and labors, as indicated in this volume, may be fully examined by the Executive and the Legislature, and the results already gained be well studied in their bearing on the prospects of what may be done in the future.

That we can raise the summer and early fall apples like Tetofski and Duchessa of Oldenburg, and the grapes like the Concord, Worden and Delaware, in abundance to supply all the wants of the State, in their season, and in beauty and quality not surpassed if equalled elsewhere, admits of no question; that the Wealthy, for a late fall and early winter apple, will be successful, when properly understood, and that it has no superior in beauty and scarcely any in quality, is generally conceded; and now, if we can import or produce here late keeping varieties of winter apples, of equal merit otherwise with the ones mentioned, the time will have come when Minnesota, instead of buying her apples for home consumption, can not only raise her own, but add this fruit to her staple farm crops and supply the regions to the north and west now dependent upon states east and south shipping through our territory. To this end, we, as a society, are laboring with confidence in the result.

As a proof of what is being done in commercial orcharding in a country where the summers are more arid than any of ours, and the winters more severe in temperature, and with less constant snow, reference is respectfully made to Prof. J. L. Budd's notes of explorations made last summer and fall in the province of Simbirsk, Russia, as published in this volume, and to other facts we present on the same subject.

Very respectfully, your obedient servant,

OLIVER GIBBS, JR.,

Secretary.

OFFICERS AND MEMBERS FOR 1883.

PRESIDENT.

JOHN S. HARRIS La Crescent

VICE PRESIDENTS.

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 F. G. GOULD Excelsior
 OSCAR ROOS Center City
 G. W. FULLER Litchfield
 E. H. S. DART Owatonna

SECRETARY,

OLIVER GIBBS, JR. Lake City

TREASURER.

J. T. GRIMES Minneapolis

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 O. F. BRAND Faribault
 M. PEARCE Minneapolis
 W. E. BRIMHALL St. Paul
 F. G. GOULD Excelsior
President, Secretary and Treasurer, ex officio.

ENTOMOLOGIST.

R. J. MENDENHALL Minneapolis

LIBRARIAN.

JAMES BOWEN, College of Agriculture, University of Minnesota, Minneapolis

COMMITTEE ON SEEDLING FRUITS.*

PETER M. GIDEON Excelsior
 M. PEARCE Minneapolis
 S. M. EMERY Lake City
 A. W. SIAS Rochester

ANNUAL REPORT

COMMITTEE ON NOMENCLATURE.*

A. J. PHILLIPS.....West, Salem, Wisconsin
WYMAN ELLIOTT.....Minneapolis
PETER M. GIDEON.....Excelsior

COMMITTEE ON FORESTRY.

L. B. HODGES.....St. Paul
H. D. ELDRIDGE.....Excelsior
COLLINS L. PRATT.....Millville

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PROF. J. L. BUDD.....Ames, Iowa
JAMES BOWEN.....Minneapolis

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A. G. TUTTLE.....Baraboo, Wis.
KNIGHT WHIPPLE.....Minnetonka

*President and Secretary, *ex officio*.

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D. K. MICHENOR.....Etna, Fillmore County
M. CUTLER.....Sumter
T. M. SMITH.....St. Paul
A. MORSE.....Austin, Mower County
WILLIAM CANNON.....Fort A. Lincoln, D. T.
G. W. FULLER.....Litchfield, Meeker County
WM. McHENRY.....St. Charles, Winona County
W. K. BATES.....Stockton, Winona County
JACOB AUSTIN.....Fergus Falls, Otter Tail County

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G. W. FULLER.....Litchfield
A. W. SIAS.....Rochester
R. N. PROBSTFIELD.....Moorhead
JACOB AUSTIN.....Fergus Falls
J. S. HARRIS.....La Crescent
S. BATES & SON.....Stockton
UNDERWOOD & EMERY.....Lake City
O. F. BRAND.....Faribault
J. H. BROWN.....Lac qui Parle
E. H. S. DART.....Owatonna

*President and Secretary *ex officio*.

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BARRETT, WM. J.	Minneapolis
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BOWEN, JAMES.	Minneapolis
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BRIMHALL, W. HENRY	St. Paul
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BULL, JAMES.	Richfield
BUNNELL, M. C.	Newport
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BUSCH, FRED.	Minneapolis
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CUZNER, E. H.	Minneapolis
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DART, E. H. S.	Owatonna
DAY, DITUS.	Farmington
DAY, A. A.	Farmington
DAY, L. E.	Farmington
DEERING, SAM'L.	St. Paul
EBERT, C. S.	Tomah, Wis
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FORSTER, MISS ANNIE.	Chatfield
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GOLDEN, W.	Plainview
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GOULD, MRS. F. G.	Excelsior
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HARRIS, FRANK I.	La Crescent
HARRIS, EUGENE E.	La Crescent
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JEWETT, Z. R.	Sparta, Wis
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JORDAN, E. B.	Rochester
KENNEY, SETH H.	Morristown
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LYON, WM.	Minneapolis
McHENRY, WM.	St. Charles

McINTOSH, WM.....	Langdon
MENDENHALL, R. J.....	Minneapolis
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NORQUIST, J.....	Red Wing
PARKER, W. L.....	Farmington
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PIERCE, M.....	Minneapolis
POOLE, JAMES W.....	Farmington
POOLE, RICHARD.....	Minneapolis
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ROLLINS, I. W.....	Elgin
RINDERKNECHT, J.....	Chatfield
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SMITH, CALEB.....	Farmington
SMITH, T. T.....	St. Paul
SMITH, TRUMAN M.....	St. Paul
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SHOEMAKER, JACOB.....	West Salem, Wis.
TAYLOR, B.....	Forestville
TEACHOUT, JOHN.....	Farmington
UNDERWOOD, J. M.....	Lake City
WELLES, J. M.....	Minneapolis
WOOLSEY, GEO. S.....	Minneapolis
WOODRUFF, PHILO.....	Faribault
WEBSTER, HIRAM.....	Lake City
WHIPPLE, KNIGHT.....	Minnetonka
WHITE, M. C.....	Minneapolis
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WILCOX, F. J.....	Northfield

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DR. JOHN A. WARDER.....	North Bend, Ohio
HON. MARSHALL P. WILDER.....	Boston, Mass.
GEO. P. PEPPER.....	Pewaukee, Wis.
E. WILCOX.....	La Crosse, Wis.
MRS. C. O. VANCLEVE.....	Minneapolis
WYMAN ELLIOT.....	Minneapolis
R. J. MENDENHALL.....	Minneapolis
MRS. WILLIAM PAIST.....	Hersey
COL. J. H. STEVENS.....	Minneapolis
J. S. HARRIS.....	La Crescent
CHARLES Y. LACY.....	Fort Benton, M. T.
CHARLES HOAG.....	Minneapolis
F. K. PHENIX.....	Delavan, Wis.
J. M. SMITH.....	Green Bay, Wis.

HONORARY MEMBERS FOR FIVE YEARS.

MISS HORTENSE SHARE.....	Rosemount
MRS. L. E. P. SPRAGUE.....	Minneapolis
MRS. JUDGE ATWATER.....	Minneapolis
MRS. W. R. MURRAY.....	Lake City
GEO. J. KELLOGG.....	Janesville, Wis.
G. P. PUTNAM.....	Ash Ridge, Wis.

MINNESOTA STATE HORTICULTURAL SOCIETY

TRANSACTIONS, 1882-3.

MEETING OF EXECUTIVE COMMITTEE.

MINNEAPOLIS, THURSDAY, JUNE 1, 1882.

The Executive Committee met at the rooms of the Young Men's Christian Association at two o'clock, P.M. Present—J. S. Harris, of La Crescent, President; D. W. Humphrey, of Faribault; Wyman Elliot, of Minneapolis, and S. M. Emery, of Lake City, representing J. M. Underwood. Colonel John H. Stevens, of Minneapolis, and Oliver Gibbs, Jr., of Lake City, being also present, by invitation, acted with the committee in their deliberations.

The following business was transacted:

Oliver Gibbs, Jr., of Lake City, was appointed Acting Secretary in place of U. S. Hollister, who had relinquished his office as Secretary by removing from the State. The Acting Secretary was authorized to superintend the publication and distribution of the transactions for the current year, and to perform all other duties incumbent on the secretary during the remainder of Mr. Hollister's term of office.

It was voted to hold the summer meeting at the Agricultural Building of the State University in Minneapolis, on Tuesday and Wednesday, June 27 and 28. Professor Edward D. Porter was appointed Superintendent of Exhibitions, and Richard Chute, C. M. Loring and M. Pearce, of Minneapolis, were requested to act as

a Committee of Arrangements for the meeting. A premium list for small fruits, flowers, plants and vegetables was agreed upon, and the Secretary was instructed to publish it, together with a suitable program of essays and discussions.

The following additional committees were appointed:

Wyman Elliot, A. W. Sias, F. G. Gould, Truman M. Smith, D. W. Humphrey, and the President and Secretary to arrange a programme and premium list for the winter meeting of 1883, and M. Pearce, J. T. Grimes, J. M. Underwood, E. B. Jordan and F. G. Gould to solicit memberships at the meetings of the society.

S. M. Emery was authorized to represent the society at the annual meeting of the American Association of Nurserymen, Seedsmen and Florists.

Orders authorized and drawn as follows:

No. 1, Wyman Elliot, for expenses of members in attendance—		
D. W. Humphrey, Faribault.....	\$ 4 50	
J. S. Harris, La Crescent.....	10 00	
O. Gibbs, Jr., Lake City.....	6 00	
S. M. Emery, Lake City.....	6 00	
Secretary, incidental.....	1 35	
		\$27 85
No. 2, C. E. Young, printing.....		11 50
No. 3, Appropriation for expenses, Secretary's office*.....		25 00

*To be accounted for at annual meeting.

A vote of thanks was tendered to the Minneapolis Young Men's Christian Association for the use of their hall for the meeting, and the committee then adjourned.

SUMMER MEETING, 1883.

PREMIUM LIST AND PROGRAM.

PREMIUM LIST.

Strawberries.

- Best display, not less than six varieties, 1st premium, \$5; 2d, \$4; 3d, \$3; 4th, \$2.
 Best variety for general market, \$3.
 Best variety for home use, perfect in flower, \$3.
 Best new seedling, with full history, and pedigree if possible, \$3.
 Best three plants in bearing, in pots or otherwise, \$3; 2d, \$2.

	1st Premium.	2d Premium.
Best quart Wilson's Albany.....	\$1 00	\$ 50
Best quart Charles Downing.....	1 00	50
Best quart Downer's Prolific.....	1 00	50
Best quart Greene's Prolific.....	1 00	50
Best quart Crescent Seedling.....	1 00	50
Best quart Captain Jack.....	1 00	50
Best quart Cumberland Triumph.....	1 00	50
Best quart Miner's Great Prolific.....	1 00	50
Best quart Red Jacket.....	1 00	50
Best quart Pioneer.....	1 00	50
Best quart Glendale.....	1 00	50
Best quart Sharpless.....	1 00	50
Best quart Manchester.....	1 00	50
Best quart Bidwell.....	1 00	50
Best quart Minnetonka Chief.....	1 00	50
Best quart Iowa Prolific.....	1 00	50
Best quart Hart's Minnesota Seedling.....	1 00	50
Best quart Kentucky.....	1 00	50
Best quart Windsor Chief.....	1 00	50
Best quart Prouty.....	1 00	50
Best quart Boyden.....	1 00	50
Best quart variety not herein named.....	1 00	50

Raspberries.

Best display, not less than three varieties.....	3 00	2 00
Best quart of reds.....	2 00	1 00
Best quart of blacks.....	2 00	1 00

Strawberries and Raspberries will be displayed on tea plates to be furnished by the society.

Plants and Flowers.

Best display of greenhouse plants....	10 00	5 00
Best display of roses in pots.....	2 00	1 00
Best display of fuchsias.....	2 00	1 00
Best display of geraniums.....	2 00	1 00
Best floral design in cut flowers.....	2 00	1 00
Best basket cut flowers.....	2 00	1 00
Best hand bouquet cut flowers.....	2 00	1 00
Best bouquet roses.....	2 00	1 00

Vegetables.

Best display.....	5 00	3 00
Best half peck green peas.....	1 00	50
Best half peck string beans.....	1 00	50
Best six bunches onions.....	1 00	50
Best six bunches beets.....	1 00	50
Best six bunches radishes.....	1 00	50
Best six bunches carrots.....	1 00	50
Best six bunches turnips.....	1 00	50
Best six bunches asparagus.....	1 00	50
Best six heads cabbage.....	1 00	50
Best three heads cauliflower.....	1 00	50
Best three heads lettuce.....	1 00	50
Best six stalks pie plant.....	1 00	50

The exhibition is open in all departments to growers in Minnesota, Wisconsin, Dakota and northern Iowa.

PROGRAM.

First Day, Tuesday, June 27.

ENTRIES FROM 9 A. M. TO 2 P. M.

2 P. M.—Opening exercises:—Addresses by President Folwell, of the State University, and President Harris, of the Horticultural Society.

Paper or address by Truman M. Smith, of St Paul, Ex-President of the Society. Subject: "Have we any practical methods to protect our fruits from spring frosts and our grapes from frosts in autumn?"

Discussion.

Paper or address by Martin W. Cook, of Rochester, Minn. Subject: "Methods of irrigation adapted to Minnesota, for small fruits and vegetables."

Discussion.

pointment of judges on premiums.

Second Day, Wednesday, June 28.

The exhibition will open at 9 A. M. and judges are requested to do their work and hand awards to Secretary by 12 M. The meeting during the forenoon will be mostly of an informal and social character, to afford members and visitors an opportunity to view the University and its grounds, the experimental farm, etc.

11 A. M.—Paper by Mrs. Anna B. Underwood, of Lake City. Subject: "Summer care of the flower garden."

Adjournment from 12 M. till 2 P. M. Basket picnic dinner.

Second Day.—Continued.

2 P. M.—Paper or address by George P. Pepper, of Pewaukee, Wis. Subject: "Best plan of premiums to carry into effect the following resolution of the society adopted at the annual meeting, January, 1882."

Resolved, That the sum of \$200 be set aside, annually, from our annual appropriation of \$1,000, to be invested in interest-bearing bonds, interest and principal to be devoted to a premium list with the object in view of increasing our list of hardy winter varieties of the apple, under such restrictions as shall be deemed best by the Society.

Discussion.

Address by Prof Edward D. Porter. Subject: "The relation of the State University to Horticulture, and how shall we interest our young men and young women in Horticulture."

Discussion.

Announcement and payment of premiums.

Report of committee on premium list and program for fall and winter meetings, appointed June 1st, 1882.

Report of committee appointed to solicit new memberships at this meeting.

General business and final adjournment.

A cordial invitation is extended to the public. Exhibition free to all. Letters of inquiry addressed to the Superintendent, President, Secretary, or any of the committee will be promptly answered.

OLIVER GIBBS, JR.,
Lake City, Acting Secretary.

JOHN S. HARRIS,
La Crescent, President.

Proceedings, Essays, Discussions and Awards.

AGRICULTURAL HALL, UNIVERSITY OF MINNESOTA, }
MINNEAPOLIS, June 27, 2 o'clock P. M. }

The Minnesota State Horticultural Society met as above, according to program, President Harris in the chair. The rooms had been decorated to present a cheerful and inviting appearance by contributions of choice plants and flowers from the green houses and gardens of the University, under the care of Mr. James Bowen, and from professional florists and others in the city of Minneapolis. At the hour of opening, the exhibition tables were already full and arranged in good order. The displays of early vegetables were exceptionally fine, cauliflowers, cucumbers and lettuce having the appearance of full grown specimens, and were in the freshest, neatest possible condition. The strawberry exhibition, notwithstanding the lateness of the season of ripening this year, embraced over twenty varieties, and the samples had been brought in by the members with a liberality that showed a design to accept the program for the picnic by calling for a committee of the whole on the strawberry question. They were displayed on heaping plates, in boxes and baskets, and about the windows in quantities that were only equaled by the number and size of accompanying packages in brown paper and in family baskets stowed under the tables, awaiting the hour for dining.

President W. W. Folwell, of the State University, by invitation of President Harris, addressed the society, welcoming the members and visitors to the University, its buildings and its grounds, and to the city of Minneapolis as well. He expressed his gratification that our meetings were exclusively for the encouragement

of the useful arts connected with the cultivation of the soil, and had none of the demoralizing influences of horse racing, too often accompanying exhibitions in agriculture and horticulture. He commended the labors of the Horticultural Society in fostering the production of new and better varieties of fruits, flowers and vegetables, and in the embellishment of the homes of the people, and promised the hearty co-operation of the University, in its educational departments, with the work the society has in hand.

President Harris returned thanks on behalf of the society for the cordial welcome given us. He complimented the regents and officers of the University for their own advancement in the practice of horticulture, as shown in the improvement of their campus and gardens, and hoped they would continue to derive practical benefit from their association with the State Horticultural Society. "Meet with us, help us in the future as you have done in the past," said he, "and we will continue to do you good." President Harris concluded his address as follows:

ADDRESS OF PRESIDENT HARRIS.

Ladies and Gentlemen, Members and friends of the State Horticultural Society:

We meet to-day in the Queen City of the Northwest for the purpose of exhibiting the fairest fruit, the most beautiful flowers, and the most useful vegetables of the season, and to discuss their merits, to secure important information, lay plans for the future and recruit our energies by taking a brief rest from toil and business. We meet in the most auspicious place in all our wide domain, the halls of scientific learning, the place of all others which should most elevate the noble calling of agriculture, and I trust that our meeting may bring new interest and greater honors upon the place.

HORTICULTURE AS AN ART.

Horticulture as an art embraces three mighty industries—the culture of fruits, culinary vegetables, and of flowers and ornamental plants. It is the oldest and first calling of man. Commenced in Paradise, it stimulates man a lost Paradise to regain. It is calculated to afford the intellect abundant themes to interest a long life and make it a perpetual gladness, joy and blessedness. It af-

fords an unceasing stream of sweet fragrance and gratifies the refined taste for delicious fruits. There is no human science that is more ample in its range or more attractive in its multiplied allurements. It unfolds to our view wide worlds of living beauty.

SMALL FRUITS AND VEGETABLES.

Its pursuit engages a large percentage of the population and much treasure and our State has assumed an exalted position in the Union for the standard of excellence of its products. Our strawberry and other small fruits stand unexcelled. Our vegetables receive the highest praise wherever they go, and our flowers, "bright gems of nature," send out their fragrance alike from the costly conservatories, bay-windows and well-kept gardens of our wealthy citizens, and the shop windows of artisans, the laboring man's cottage and humble yard, telling the stranger and tourist that Minnesotians are a refined people, and reminding all that the mission of our profession is a two-fold one, to please the senses and satisfy the mind. A panorama of the past would show that unparalleled progress has been made within the little more than a quarter of a century of our existence as a State, and it would show that much of this progress is the fruit of the patient toil, study and perseverance of the members of our State Horticultural Society. A beneficent Providence has given us a healthy climate and a virgin soil, but it has left it to horticulture to dig, delve and find the surest road to success amidst the greatest difficulties and make its culture an industry that shall add to the wealth and happiness of mankind.

THE GOOD WORK OF THE SOCIETY.

Since the organization of this society in 1866, we have learned much, but we have not learned all that is worth knowing. The field we have attempted to occupy is great, the laborers few, and the obstacles mighty, and until the field is all occupied and every tiller of the soil is enlisted with us and the mountains of difficulty are removed and the valleys of failure are filled; until an abundance of the best fruits of the season find a place upon our farmers' tables the year round, and they are produced so plentifully and cheap that the poorest of our laboring population can afford them as a leading article of food; until every home in our land has its flowers and lawns and pleasure grounds, there will be a necessity that we meet in conventions and reunions for the mutual exchange of ideas, and to tell over our well learned and dearly bought lessons of experience.

SCARCELY PERFECTED THE A B O'S, YET.

With all the progress we have made we are to-day scarcely out of the A B C's of the great book of Horticulture. The Wilson strawberry stands to-day as it did a score of years since at the head of the list for general cultivation, and it is too uncertain for the ordinary farmer. The choicest raspberries will not withstand the rigors of our winters. Of blackberries, the Snyder alone will give us a liberal crop after a mild winter, and the Siberian species of apples, with the addition of the Duchess, Tetofsky and Wealthy, still remain the only safe ones to plant except in the most favored locality. Doubtless our native fruits will prove susceptible of improvement, and many of the choicer fruits of other climes can, in the course of time, be acclimated and made at home with us. Science, learning and the experience of the past are at our command, and the refined tastes, appetites and actual necessities of a million people are calling on us to arise and fulfill our mission; and when it is fulfilled the veteran survivors will put in a grand jubilee.

MORE HARD WORK.

There still remains before us an unlimited field for advancement. We have learned by dearly bought experience what we ought to have known by observation years since. We have learned that the varieties of apples and other fruits that have originated in the eastern and middle States, with a few exceptions, will not thrive in Minnesota or the northwest. We even know that varieties that have been originated and have acquired great celebrity in one neighborhood or locality have proved unworthy of cultivation in another adjoining and apparently equally favorable locality, but why it should be so we do not fully understand, and it will require careful research, observation and experiment to master the subject, and we have no time for that. We want an abundance of the best quality of fruit in the very shortest possible time, and to have it we must originate or create it. If we look back through the geological epochs of our globe we find constant changes and continued development indelibly stamped upon the remains of every species of animal and plant. We also notice that every thing changes more rapidly under cultivation and domestication. Everything changes slowly by nature, some for good and some for evil, but very rapidly in a certain direction when aided by wise selections. For illustration I refer you to the fine breeds of sheep, swine and cattle of to-day as compared with those of our boyhood days. We ought to have

thoroughbred trees, fruits, flowers and vegetables, and the sooner we set about producing them the sooner will the croakers' cry of "Minnesota is no fruit State" be hushed, and our State will have assumed the position she ought to occupy.

HYBRIDIZING.

The way opened to us is through hybridization—artificial crossing and judicious selection—"saving the fittest." This will require specialists or careful, intelligent breeders in various parts of the State; for so large and varied a State as ours, one farm for the experiments and one man to conduct them is not enough; a hundred or a thousand are not too many. Each locality has its peculiarities of soils and meteorological conditions. As yet but little is known as to the most effective and desirable constituents of soils and manures in their relation to the formation of variety in their action upon the growing and germinating of the seed. We do not longer need to grope in the dark or trust to accident, after the results that have been attained by careful solution by such men as Dr. VanMors, Andrew Knight, Candalle, Rivers, Rogers and Bull, to whom this generation is indebted for some of the finest varieties of apples, pears, peaches and grapes, but with this method the elements of chance have remained to a great degree, and millions of varieties have been rejected, representing time, labor and patience, and this calls for a more speedy method, which shall be more certain and satisfactory in its results, viz: artificial crossing and hybridizing. We want a better strawberry than the Wilson. The Concord is called the grape for the million here in the North. The vine is good enough, but the fruit does not meet our wants. It is hardly early enough for our short seasons, and perishes too soon after it ripens. In apples we want Duchess of Oldenburg trees, bearing fruit covering the whole season from July to June, with the quality of the early Russets, Northern Spies, Seek-no-furtherers, Bellflowers, and Golden Pippins. To get them speedily we want a score of such men as Rogers, Moore, Campbell, Rickets, Pepper, Beall and Budd.

MORE EDUCATION.

To bring about these desirable results we must become more thoroughly educated in the fundamental principles of our noble occupation. All honor to the man who first originated the idea of scientific agricultural colleges. We have met to-day in the Agricultural College of Minnesota, where the preliminary knowl-

edge that can lead to future success can be abundantly furnished, and every agriculturist who has a son or a daughter and can properly spare the means should not fail to give them a literary course in this institute. By all means send up the girls, that there may be some ladies for the coming generation that may be fitted to adorn rural homes.

YOUNG LADIES AND WOMEN AS FLORISTS.

We now and then see a young lady who can adorn any station in life, and yet can pick a hundred quarts of strawberries in a day and find time to help her mother about the house work. Women make good florists—and why may they not become equally famous horticulturists?

My friends, before I close let me call your attention to the members of this society. Who and what are they? They are worthy men who have passed the meridian of life. They are men who have worked hard with one steady end in view; most, perhaps all of them, will be gathered to their fathers long before the mission of the society is finished. Will the work and the society die with them? Where are the young men and boys from whom we can recruit and fill our ranks after we have gone to our rest? An effort should be made to enlist their help.

HORTICULTURAL LITERATURE WANTED.

To do this we want more horticultural literature and more local societies and more popular meetings, and the premiums of our fairs should be especially arranged for their benefit. I would direct your attention to my address at the close of the last annual meeting, and would add to those remarks by saying: Bring as much as possible the social element into the meetings and harvest picnic, and berries and cream should be inexpensive in the country, and the children would enjoy them hugely. Let object lessons be given in budding and grafting, crossing and hybridizing, making and planting of cuttings and layers, and offer a suitable prize to the child that becomes most proficient in these. I believe that this course, persistently pursued, would fill the ranks of our society so that no hall in this city would be large enough to accommodate such a meeting as this.

PROCEEDINGS AND DISCUSSIONS.

E. Wilcox, of La Crosse, one of the honorary life members of this society, and Geo. J. Kellogg, of Janesville, presented their credentials as delegates representing the Wisconsin State Horticultural Society, and were welcomed by President Harris to participation in our debates and festivities, and on motion Mr. Kellogg was elected an honorary member for five years. G. H. Putnam, of Ash Ridge, Wisconsin, being introduced by Mr. Kellogg as a member of the Wisconsin Society, was welcomed and elected in like manner.

Mr. Wilcox, in replying to the address of welcome, spoke of the various drawbacks in horticulture—the blight, the mildew, the rot, the ravages of insects and injuries from severities of seasons, that have hindered us in times past. He counseled courage and perseverance, and predicted final success in fruit raising. In closing, he said: "There has been an allusion by your president, and I think wisely, to the absence of the young from our meetings and the necessity of enlisting their interest in our work. These old gray-beards are soon to pass away, and we should all—members of our Horticultural Societies and officers of our State Universities—take hold and do our utmost to recruit the ranks and see to it that our work is continued when we shall have laid down the burden."

Mr. Kellogg said he had been a resident of Wisconsin for over forty years, and that their work had been and was still almost identical with that of their Minnesota brethren; the same ups and downs, with only perhaps a little wider range of varieties grown, and he was glad to see the feeling of harmony and co-operation that is growing up between the Horticultural Societies of the two states. He hoped the practice of sending delegates to each others' meetings would be continued, in order that each state might have the benefit of the others' work accruing from the interchange of such courtesies and especially from the reports of delegates of what they see and hear abroad.

PROTECTION FROM FROST

The protection of small fruits and vegetables from untimely frosts in spring and autumn was the subject next in order. Truman M. Smith not having furnished the appointed paper, Mr. Wilcox was called up to state his experience. He said the most important means of protection was to locate the fruit grounds on elevated situations. His place at La Crosse was in a notch of the bluffs, extending from half way up from the level of the La Crosse prairie, to the summit of the bluff, which he called Mount Hope. In looking over his strawberry, raspberry and grape grounds to note the effect of the recent remarkable frost of May 23, he found the injury decreased in proportion to the elevation as the plats ascended the side hill.

G. W. Fuller, of Litchfield, inquired if we were more liable to destructive spring frosts in Minnesota than other sections of the West. He had an impression that the deep freezing experienced here, and the long retention of the frost in the ground in the spring usually goes in our favor in comparison with some of the more southern localities, by retarding the too early growth of vegetation, and recommended heavy mulching to keep the frost in.

President Harris corroborated this view; but he had protected his grapes and apples this spring by burning a lot of old straw near his vineyard and orchard. While the smoke was circulating during the night of May 23, he could hear the melting frost dripping from the trees. Fruit on high grounds in his part of the State had been comparatively exempt from injury from that frost, and he thought also the trees on such locations were generally showing less of the fire blight.

Secretary Gibbs: Everywhere we find less winter-killing also on elevated sites.

Prof. Edward D. Porter being called upon, said he was sitting here at the feet of the Gamaliels, but was willing to give his experience in the East, particularly in the regions of Delaware and the Chesapeake Bay. Among the hills on that peninsula were to be found the locations most exempt from frost. On the more elevated portions, or in the near vicinity of water, there were peach orchards that had not failed in fifty years. Here in Minnesota he had seen, in his observations this spring, that the vegetation on the hills above an altitude of say twenty-five or thirty feet, and on the easterly ridges, was nearly or quite uninjured by the frost of May 23, while below this the marks of injury were everywhere to

be seen. This was due to the free circulation of air over the elevations and slopes referred to. One other thing he had noticed this spring that was novel and peculiar to him, and that was that when the potato tops were killed to the ground, the after growth sprang from new and previously undeveloped buds.

Secretary Gibbs mentioned a plan suggested to him by George H. Nichols, now of Minneapolis, who owned a very successful vineyard at Prescott, Wisconsin, and that was to protect grapes from frost by hanging over the trellises sheets of express paper, or strawberries, by laying this paper over the beds. It can be bought at six or seven cents per pound, and in size is four feet by seven. A few cents worth would cover a good many dollars worth of fruit, and it was worth trying.

Mr. Kellogg advised being careful not to tie up the grape vines too early in the spring. With him the proper time was usually as soon as he got a bite from the mosquitoes. This year he did not dare to wait for that sign.

Mr. Wilcox thought mulching did not retard the growth of trees in the spring.

M. Pearce, of Minneapolis, agreed with Mr. Wilcox that elevation was the only sure protection, but spoke of the favorable influence of bodies of water, as seen by the exemption of fruit from frost this spring along the shores of Lake Minnetonka.

DISCUSSION ON STRAWBERRIES.

Wyman Elliot, of Minneapolis, was called upon to give his recent experience with strawberries, said: "The general opinion around Minneapolis is that the Crescent Seedling is the coming strawberry, but you must not give it too high cultivation. He spoke well of Minnetonka Chief, Mr. Woolsey's new seedling, and of Hart's Minnesota seedling. These might be stimulated without injury. His experience so far was satisfactory with the Bidwell. For general cultivation he would recommend setting plants of all sorts before the 15th of May; but for trial of new sorts it would do in August, to a limited extent, or with potted plants, and a fair crop obtained the next year.

Mr. Pearce concurred.

Mr. G. S. Woolsey, of Minneapolis, preferred fall setting. Had no difficulty in making the plants live.

President Harris said if the fall setting meant in August he was opposed to it, but later in the season, say after the fall rains come on, they would often do well.

Mr. Elliot had found that potted plants knocked out of the pots and heeled in, in the latter part of October, came out good in the spring, and rooted runners can be also heeled in at the same season, and saved if the work is carefully done. In reply to an inquiry he said he used two-inch pots and confined the runner over it till rooted by a lump of earth or any other light weight. Swamp muck had been used with success as a soil to fill into the pots.

DISCUSSION ON FROST RESUMED.

Mr. Putnam being called out, gave an account of severe losses of fruit by the recent frost in Wisconsin. He had been puzzled by noticing that some of the grapes that had never been laid down at all and had started most were injured less than those held back by lying on the ground. These were mostly Concords that had run up on the apple trees and fences. They had an arbor vitæ hedge on the east and south. This was the only frost that had injured fruit in that section for sixteen years.

Mr. Woolsey found that grapes that had been uncovered early and that had strong shoots were uninjured, while those uncovered shortly before the frost were badly hurt.

Isaac Fawcett, of Minneapolis, thought that white frosts, never, as a rule, did any injury on high elevations, but when of sufficient severity to freeze the ground the injury was apt to be more severe than on low grounds. Strawberries, as a rule, would endure our white frosts. He did not think mulching of strawberries was of any avail as a protection from spring frosts.

Mr. Pearce had found that vines which stood out uncovered through the winter would endure severer cold than those mulched and afterwards uncovered.

Col. Stevens asked for information from Mr. Norquist, of Red Wing as to the effect of frost in his vineyard. Mr. Norquist replied that his grounds were elevated, being about three hundred feet above the waters of the Mississippi river, and his grapes were entirely uninjured. Had uncovered and tied them up three weeks before the frost of May 23, and they had made about four inches of growth at the time of the frost. Strawberries also escaped. They had been uncovered just before the frost.

Prof. Porter said that recent cultivation of the soil before a frost radiated the heat more freely, and was a protection from injury.

Several members alluded to freaks of the frosts in taking some plants and leaving of others, and Prof. Porter remarked that these

things admonished us to be more careful and constant in our observations of facts brought within our reach, and thought by this means the most of our horticultural puzzles would yield us a practical solution.

W. J. Abernethy, of Minneapolis, had been troubled with barren vines where he had put on heavy mulching and left it there till late in the season. Last year he uncovered early and had a good crop. His soil was heavy and cold and needed warming up.

Mr. Kellogg said he could prove anything in horticulture by competent witnesses. He wanted to be sworn now on both sides. J. M. Smith, of Green Bay, Wis., had raised the Wilson strawberry at the rate of 440 bushels to the acre, and his practice was to uncover early and cultivate. On the other hand, B. F. Adams, of Madison, who shared the honors with Mr. Smith, as one of the two most successful strawberry growers in Wisconsin, mulched heavily with straw and left it on the ground.

Wyman Elliott, on behalf of the Minneapolis delegation, invited the members of the society, and their guests from other States, to take a carriage ride with them to-morrow afternoon to view the city of Minneapolis and its surroundings, and to visit the fruit farms and market gardens in the neighboring towns, and it was voted to accept the invitation, and to change the program accordingly, having the papers and essays of absent writers laid over to the winter meeting or referred to the secretary for publication.

Judges on exhibits were appointed as follows:

On Fruits—Messrs. Fawcett, Putnam and Fuller.

On Plants and Flowers—James Bowen, Mrs. F. G. Gould, and Mrs. L. E. P. Sprague.

On Vegetables—Prof. Porter and Messrs. White and Fuller.

Adjourned till nine o'clock to-morrow morning.

MORNING SESSION.

SECOND DAY.

AGRICULTURAL HALL, UNIVERSITY OF MINNESOTA, }
MINNEAPOLIS, June 28, 9 A. M. }

The society met according to adjournment, and was called to order by the president.

Mrs. Underwood, being present, read her paper as follows:

SUMMER CARE OF THE FLOWER GARDEN.

BY ANNA B. UNDERWOOD, OF LAKE CITY.

When this subject was first suggested it seemed simple enough, but due deliberation upon it revealed many points that if carefully carried out and treated in all their details, would prove a severe task for both writer and listener. There is so much that might be said about each plant, its general characteristics, habits of growth, soil best adapted to its wants, and methods and means of promoting the most healthful growth and abundance of foliage and flowers, that a volume of large dimensions might well be written with profit to all. But such an Herculean task could not be undertaken by the writer, were mere willingness alone wanted, for the simple reason, a very good one however, lack of ability. A few suggestions proven reliable by actual experience is all that will be ventured upon at this time.

WHAT IS A FLOWER GARDEN?

The term flower garden is so comprehensive in its signification, that it necessarily needs considerable modification to be able to treat it in a practical manner. A flower garden to one person would suggest a large tract of ground comprising acres, laid out beautifully with fancy shaped beds, gravelled walks, fountains, rockeries, etc., under the direct supervision of a professional, whose whole time and energies are spent in perfecting the most elaborate plans. To another person it suggests a more moderate sized enclosure, a handsome lawn well kept, with fancy beds scattered here and there filled with lovely flowers and foliage plants from the greenhouse, planned and directed by the feminine portion of the household, for they are generally the most interested in flowers, but all the work being performed by the gardener. To yet another person would be suggested a still more modest one, comprising only a few ornamental beds on the lawn and side beds for cut flowers; and last, but not least, some one would think of the more humble one consisting of a bed placed side by side with the more useful beds of the kitchen garden, and from which many bouquets may be cut. These are really the four classes into which flower gardens may be divided. The first exhibits everything that art, skill, and above all, money can procure. The loveliest from all lands are made to contribute to the general effect, to the grand climax of a reproduced garden of Eden, and we stand by and gaze with awe and admiration at the result of the expenditure of so much time and money. To be sure it is very nice, indeed grand, but very few of us after drinking our fill of the beautiful scene, are inspired to go home and do likewise, for the simple reason we couldn't if we would, for we have not the time, still less the money, to use in this way.

The second class of flower gardens, after drawing liberally from the owner's greenhouse and purse, is a pleasant sight, and—well it would be nice to always have some one to do the hard work, ready to put their hands in the dirty soil, while we stood by with our hands so soft and white, enjoying the result—but alas! the sight of such an one is not inspiring either, for we do not all possess the requisite article—a hired man to come and go, dig and hoe, fetch and carry as we wish. These two flower gardens would require a treatise of formidable dimensions to convey an idea of the work and requisite care demanded in the carrying out of the plans of the spring campaign, and the bringing out of all the beauties

the different varieties are capable of, uniting them into one grand whole. It is, in fact, the study of a lifetime—a profession. The discussion of these we will leave to the trade, and only give thought to the last two, which may be treated at the same time, as they have many points in common.

THE SHRUBBERY.

In the first place, it is to be supposed that every flower garden has more or less shrubs according to its size. These, after the first spading around in the spring and trimming dead branches off and scraggly ones into shape, require no further care through the summer, except to keep the weeds down, making them as slightly as possible, if they are not in bloom. In doing this don't carry out the mistaken idea, some believe in, of turning the family horse or cow into the yard to wander at its own sweet will, and then wonder why it is that your shrubs, specimen trees, etc., look so "one-sided, you know!" Only the other day I saw a horse very carefully tethered out on a small lawn, so that he was enabled to plant his hind feet in, on and around a nice arbor vitæ hedge, his mouth being busily engaged in tasting the nourishing qualities of the leaves and tender branches of a tree near by. Next spring the owner of the hedge will be very much surprised to find a number of his arbor vitæ deceased, and he will straightway blame himself and his horse? Not he! The nurseymen, sir, must have delivered him some poor stock! It was about dead when he received it, etc., etc.

CLIMBERS.

The climbing vines should be given proper support. Old stumps and fences, all unsightly objects should have had the proper attention given them in spring, putting around them seeds and plants of hardy climbing vines, and after seeing them well started these will need no further attention other than to direct their wandering fancies in the right direction and path of duty, namely, to cover as much space as possible.

ROSES AND GERANIUMS.

Roses—well, these were so nicely treated at our winter meeting of 1881, that I will only refer you to the printed report of that meeting, knowing that a re-perusal of it will benefit you as I know it did me. The house plants after having exerted themselves all

winter in their cramped quarters in the windows, etc., to make life pleasant, where their bright foliage, blossoms and fragrance are only too glad to be allowed the privilege of stretching themselves as much as they please in the beds prepared for them, and make us laugh—and they look as though *they* would like to—at the grotesque manner in which they will double themselves in their freedom. The delicacy of the rose geranium is lost in a coarse leaf rivaling the turnip leaf in roughness and size, and for bouquets we turn in quick relief to carrot tops, parsley, etc. The flowers of our house plants—well, I, for one, do not care for them in the summer time. I want a rest from them, and am sure they need the rest. In summer time, then, let us have something new—let us place our main reliance on summer flowers.

GET SEED IN TIME.

In late winter or early spring make a selection of seed, getting it from some reliable seedsman, that you may be sure the seed is reasonably fresh. Don't allow yourself to try everything the catalogue offers, but take just a few varieties, those you know will do well in the soil of your garden and its location. The next year try something new, but always have the most of varieties you can rely on. Some varieties, verbenas, phlox, pansies, astors, etc., should be started in boxes or in a hotbed. Others—mignonnette, petunias, nemophilas, etc., should be sown where they are to remain. Most catalogues will give the suitable way of starting each variety. Before sowing the seed or setting the plants the soil should be next attended to. Now turn the attention to the location and arrangement of the flower beds. If possible, secure bright, sunny places, for there are few plants but what love to bask in the sunshine. Even pansies, though it has been claimed for them ever since they were known that they love a shady place, will flower profusely beside that sun-loving plant, the verbena, during the hottest days of midsummer. If it chance to be very dry as well, they will look tired and weary perhaps, but a few cool days and a good smart rain will bring them out with bright laughing faces again, seeming almost to talk to one, they look so intelligent. Pansies will grow very large in the shade, but it is, I think, at the expense of beauty and numbers. An overgrown pansy looks much like anything else overgrown, a curiosity, but not a thing of beauty, losing its grace and delicacy at expense of size.

Do not make the mistake of putting beds around or under large bushes or trees, for these have such large, strong roots that they

sap all the moisture and nourishment from the ground, and the young plants grow spindling and sickly, yielding few, if any, flowers. If a shady place is necessary, put the bed on the shady side of the house or fence, or make an artificial shade for it, but don't put it where the plants will be starved to death by large roots draining the earth all around them. Unless sure of the aid from the stronger half of society, don't undertake many fancy beds on the lawn, for they will require a great deal of attention to keep the grass out, and, unless well attended to, they will mar the general beauty of the lawn. The beds on the lawn ought not to be relied on for cut flowers, their object being to beautify the lawn, so for this purpose have a good generous flower bed laid out at the side or rear of the house, or next the kitchen garden. Do not spend any time or strength in devising elaborate designs for the bed of triangles, half moons, whole moons, harps, hearts, etc., for these will prove worse than useless; to make these shapes, the beds have to be raised, and herein lies one great source of failure, all the water that falls upon such beds is quickly drained into the surrounding walks, and in a very dry season the plants cannot live unless supplied almost daily by the watering-pot, and flowers raised under such trying circumstances are not as productive of enjoyment as though they cost a little less hard work. Raised beds will do for very wet locations, where the drainage is poor and the water is apt to stand for a long time, but such places are rare around us. In very dry, sandy places having the walks higher than the beds would add to the moisture of the bed. Then, as a rule, have the beds no higher than the walks. Simply mark out the bed on the ground with rope, not too wide, so it can be weeded conveniently and easily cared for. Have the ground well spaded, or plowed, if large enough, and well manured, all coarse straw, sticks and stones removed, and raked over smoothly, and the bed is ready for the seeds and plants.

TRANSPLANTING PLANTS.

The best time for setting plants is just before or just after a rain; or, if not practicable to wait for a rain, mud the roots well and set out late in the day, wetting the ground thoroughly. The next morning, if the sun proves hot, shade with paper, leaves, grass, etc., for a day or two, and they will get a good start. Plant all of a variety by themselves in a tasteful manner, they show to better advantage than when scattered. Study well the growth and habits of your plants before setting, and do not crowd them, as they will

make larger growth and yield more and finer flowers if given room according to their strength. Now right here is where the summer care in reality begins, and it is where nine-tenths of the would-be gardeners leave off. House cleaning, summer clothes, business cares, etc., demand full attention. The flower beds look so clean and nice with their regular rows of plants or sticks where plants will be if the seeds will only fulfill their duty and "come up," that certainly it will not be necessary to give them any further attention for the present at least, and they slowly glide from memory and are soon wholly forgotten. Forgotten until some friend happening in, the notes and events of the past few weeks are compared and discussed, and the friend is straightway led out to view the result of the spring enthusiasm. Well, enthusiasm wanes rapidly on discovering the flower beds covered with a luxuriant growth of weeds, and while retreating ingloriously from the scene of discomfiture, a mental resolution is made to continue the work of renovation that has been going on in-doors, and have a general "clarin'-up time" in the flower garden. But alas! the discovery of the interlopers and the resolutions are made too late—the mischief has already been done. The weeds grew so fast that most of the seeds were too much discouraged to try to come up, and those that made the effort were so starved and choked, all the goodness of the soil and space being so monopolized, that only a very spindling weak growth has been made, and they only excite feelings of pity and sorrow. The result of the onslaught on the weeds is a nice clean bed, with here and there a poor forlorn plant that, struggle as it may, will scarcely be able to cast a shadow ere the early frost will put an end to its miserable existence. Well, a bed of pigeon grass, pig weed, May weed, etc., is rather preferable to a bed of bare ground, and this is the end of the bright plans of spring. A little care exercised at the first would have avoided all this disappointment.

The flower garden, to succeed well, should receive as careful attention as the beets, turnips, corn, potatoes, etc., of the kitchen garden. These vegetables, to do well, must be well cultivated, the ground kept well stirred around them, weeds hoed out, must not be too crowded, and the result is pleasing. It is a good plan to have the bulk of the plants for cutting placed in a straight bed by the side of the kitchen garden, and then while the good man, brother or son, is hoeing among the onions, tomatoes, etc., he might possibly be induced—by its close proximity—to hoe the flower bed too. One thing is certain, the weeds must be kept under subjection, and the soil well cultivated, and after a while the weeds will prove to be

the discouraged ones, and leave the field vanquished to their better appreciated rivals. Under such treatment the plants will grow rapidly, and soon begin to bloom profusely. In order to keep the bed in full flower, do not let the plants go to seed, for this uses up a large portion of the plant's vitality. As soon as faded, remove the cluster and two or more will start at once, and the plant will increase in loveliness. Do not be afraid to pick bouquets for the house, and to give away, for they will blossom the more profusely for the systematic pruning, and the beds be brighter and gayer, the plants stronger and healthier. Even the early frosts will only remove the advanced buds, and the succeeding warm days will almost always coax out another growth of buds and blossoms. If a very dry time comes in summer, water thoroughly at night, and cover the ground around the plants with a light mulching of dry grass, leaves, or straw, it will aid in retaining the moisture. The sum and substance of the general care of the flower garden may be summed up in these few words. Keep the weeds out and the young plants well cultivated and not allow them to seed. These three suggestions well carried out, and success will crown all efforts.

BUGS AND WORMS.

Bugs and worms will appear, but plants in a good healthy growing condition will always hold their own. While speaking of bugs, I would like to ask a question or two of the learned solons gathered here in wise deliberations on ways and means of securing horticultural benefits, what is the name of the long black bug, a good half inch or more in length that pounces on the asters just as they are coming into bloom, and in an incredibly short space of time, destroys every blossom and bud in sight, and then will disappear as suddenly as it came? After this season of trial the plants seem to recover themselves and the balance of the season will do well, neither are they troubled again by their black enemy. This is the experience of the past two years. I would like a name for this bug, and, if you please, the bigger it is and the more Latin about it, the better it will suit me. For this summer, when the few asters I have come into flower, and this miserable bug puts in his appearance—well—not being a man I can't swear at him, but it certainly would be quite comforting to be able to stand with a bold front toward him, and hurl his name at him at least. Is there any known means of preventing the ravages of this bug, or am I the only one favored with his attentions? I have never heard or seen

any mention made of such an intruder, or else have not recognized him under his professional title.

A vote of thanks was tendered to Mrs. Underwood for her useful and entertaining paper.

W. G. Hendrickson, of St. Paul, asked for a remedy for rose slugs.

S. M. Emery, of Lake City, suggested soap suds and whale oil.

A general discussion followed on the subject of insecticide applications for small fruits and flowers. Pyrethrum, or "Persian Insect Powder," now manufactured extensively at Stockton, California, from plants grown there by a company, of whose operations Mr. G. W. Milco is superintendent, was described by the Secretary, from facts furnished by Prof. W. A. Henry, of the State University, of Madison, Wisconsin, and was indorsed by President Harris and Mr. Kellogg, as non-poisonous to any species of animal life, except insects, breathing through their sides, and perfectly effective in destroying them. All present deprecated the use of any deadly poisons in fruit plantations.

The judges in the several departments, reported the following premiums awarded:

STRAWBERRIES.

Best display, not less than six varieties, Geo. J. Kellogg, Janesville, Wis.

Second best, Underwood & Emery, Lake City.

Best variety for general market, B. F. Adams, Madison, Wis., on quart of Wilson's.

Best variety for home use, perfect in flower, Geo. J. Kellogg, on quart of Charles Downing.

Best New Seedling, Geo. S. Woolsey, Minneapolis, on quart of Eureka.*

Best three plants in bearing, Geo. S. Woolsey, on Eureka, Minnetonka and Captain Jack.

Second best, F. G. Gould, Excelsior, on Wilson and Crescent Seedling.

Best quart Wilson's Albany, Oliver Gibbs, Jr., Lake City.

Second best, F. G. Gould.

Best quart Charles Downing, Geo. J. Kellogg.

Best quart Downer's Prolific, Wyman Elliot, Minneapolis.

Second best, M. Pearce, Minneapolis.

Best quart Greene's Prolific, Underwood & Emery.

Second best, Geo. J. Kellogg

Best quart Crescent Seedling, W. J. Abernethy.

Second best, Underwood & Emery.

Best quart Captain Jack, Underwood & Emery.

*Supposed to be a cross between Early Scarlet and Jucunda.

Second best, Geo. S. Woolsey.

Best quart Red Jacket, Underwood & Emery.

Best quart Minnetonka Chief, Wyman Elliot.

Second best, Geo. S. Woolsey.

Best quart Iowa Prolific, John Norquist, Red Wing.

Best quart Hart's Minnesota Seedling, Wyman Elliot.

Best quart Kentucky, Underwood & Emery.

Best quart Windsor Chief, Wm. Lyons, Minneapolis.

Best quart Prouty, Underwood & Emery.

Best quart Boyden, Underwood & Emery.

Best Glendale, Wm Lyons,

The other exhibits in Strawberries were as follows:

For general market, Wilsons, by Geo. J. Kellogg, Janesville; E. Wilcox & Son, La Crosse; Oliver Gibbs, Jr., Lake City; Windsor Chief, Crescent and Countess de Harricout, by Wm. Lyons, Minneapolis; and Windsor and Crescent by F. G. Gould, Excelsior.

Variety for home use, Crescent, by F. G. Gould; Wilson by Oliver Gibbs, Jr., and Countess de Harricout by Wm Lyons.

Single quarts—Wilson, by Geo. F. Kellogg, E. Wilcox & Son; Henry F. Bussee, Minneapolis; and Underwood & Emery; Downer's Prolific, by Geo. J. Kellogg; Crescent Seedling, by Geo. J. Kellogg, E. Wilcox & Son, Henry F. Bussee, F. G. Gould, Wyman Elliott, M. Pearce, Wm. Lyons and Geo. S. Woolsey; Countess de Harricout, by Henry F. Bussee, Wm. Lyons; and Glendale by Geo. S. Woolsey.

Samples—Cumberland Triumph, by Geo. J. Kellogg; Bidwell, by Wyman Elliot; Pioneer, Windsor Chief and Glendale, by M. Pearce and Sharpless by Wm. Lyons.

CHERRIES.

Best quart Early Richmonds, Oliver Gibbs, Jr., from tree at Lake City, planted in 1870. Special premium of two dollars voted by the society on recommendation of the committee.

PLANTS AND FLOWERS.

Best display of green house plants, E. H. Cuzner, Minneapolis.

Second best, Mendenhall green house, Minneapolis.

Best display of fuchsias, E. H. Cuzner.

Second best, Mendenhall Greenhouse.

Best display of geraniums, E. H. Cuzner.

Second best, Mendenhall Greenhouse.

Best design in cut flowers, Mrs. Anna B. Underwood, Lake City.

Best basket of cut flowers, W. J. Barrett, Minneapolis.

Second best, Mendenhall Greenhouse.

Best hand bouquet, W. J. Barrett.

Second best, Mendenhall Greenhouse.

Best bouquet of roses, W. G. Kerridge, Minneapolis.

Second best, Mrs. Anna B. Underwood.

Best display of pansies, 10 varieties, J. R. Grimes, Minneapolis,

special premium of two dollars voted by the society on recommendation of the committee. Exhibits were also made in this department, as follows: Mrs. F. G. Gould, Excelsior, bouquet of roses; Mrs. A. B. Underwood, hand bouquet, and Mrs. W. G. Hendrickson, St. Paul, basket of roses and box of cut flowers.

VEGETABLES.

Best half peck green peas, Landreth's Extra Early, Wyman Elliot.

Best 6 bunches beets, Egyptian, Fred. Busch, Richfield.

Best 6 bunches of carrots, Early Horn, Wyman Elliot.

Best 6 bunches turnips, J. S. Gray, Minneapolis.

Best 6 bunches asparagus, Conover's, Frank Abernethy, Minneapolis.

Best 3 heads cabbage, Jersey Wakefield, Vincent Reeves, Minneapolis.

Best 3 heads cauliflowers, Snowball, Fred. Busch.

Best 3 heads lettuce, Simpson's, Vincent Reeves.

Second best, Satisfaction, Fred. Busch.

Best 6 stalks pie plant, Frank Abernethy.

Best 6 cucumbers, White Spine, Fred. Busch.

Committee recommended a diploma to Wyman Elliot for a display of potatoes, fifteen varieties, crop of 1881, brought in to show their keeping qualities—which was voted unanimously.

A list of premiums awarded was handed to the treasurer who paid them immediately after the adjournment.

The sum of seven dollars was voted to President Harris to reimburse him for his personal expenses in attending the meeting.

Mr. Kellogg informed the society that the Wisconsin delegation "in view of past and present felicities here and prospects ahead" had held a little meeting by themselves and desired to report their proceedings to be incorporated with the society's minutes, which were on motion received and recorded, as follows:

Whereas, the Minnesota Horticultural Society and the citizens of Minneapolis have extended to the delegates and visitors from abroad, a cordial reception and unbounded hospitality. therefore

Resolved, That we tender our sincere thanks to the members of this society and all who have made our stay so pleasant, and we extend a pressing invitation to them, personally, to meet us in convention and at our homes.

GEO. J. KELLOGG, Janesville, Wis.

E. WILCOX, La Crosse.

GEO. H. PUTNAM, Ash Ridge.

June 28, 1882.

At the suggestion of the President, it was voted that all new members joining at this meeting, or at any future time this year, be continued as members till the annual meeting in 1884.

The hour for the picnic dinner having now arrived, and the committee of the whole upon the state of the strawberries and lunch baskets being ready to proceed to business, and the usual resolutions of thanks to the citizens of Minneapolis, the press and the railroads, and especially to the officers and students of the University, having been voted for hospitalities and benefits received, the society formally adjourned at 12 o'clock, noon, and immediately re-assembled, informally, in the lecture room above, with their families, their friends, visitors and guests; and the Minneapolis delegation, acting as hosts for the occasion, the entire stock of strawberries on exhibition was submitted for sampling without reserve. Crescents and Wilsons, Downings and Captain Jacks, Greene's Prolifics and Downer's, Red Jackets and Iowa Prolifics, Hart's Seedlings and Minnetonka Chiefs, Countess de Harricourts and Eurekas, and all the other rival favorites contended for the bauble reputation at the taster's mouth, till appetites were satisfied and time was up; and of the remains of the feast, there were gathered up and sent to absent friends in the city, an abundance of strawberries of best samples yet untouched.

At one o'clock Wyman Elliot and his associates of the Minneapolis delegation appeared on the campus with carriages for the excursion around the city and its suburbs, and the members present and their guests taking seats therein, disappeared as a body from the view, at the rate of about twelve miles an hour. And now the secretary, halting between official propriety as a recorder of the society's transactions when duly assembled, and his impression that a vote of thanks ought to appear here for the share of Wyman Elliot and his associates of the Minneapolis delegation in the afternoon's piloting of the party, especially among the market gardens and strawberry and raspberry plantations of Minnetonka, Richfield and Minneapolis, where most valuable lessons in horticulture were learned for future benefits in the society, begs leave to reserve a blank, indicated by the following stars, and requests the members of the excursion party from outside of Minneapolis to fill it up and gild it with the happiest terms they can devise to that effect. * * * * * *

Orders drawn on treasurer as follows:

Oliver Gibbs, Jr., on salary as secretary.....	\$50.00
J. S. Harris, president's expenses.....	7.00

Premiums awarded :

Fruits.....	\$42.00
Plants and flowers.....	34.00
Vegetables.....	10.50
	<hr/> \$86.50

MEETING OF THE EXECUTIVE COMMITTEE.

ROCHESTER, Wednesday Evening, Sept. 6, 1882.

The Executive Committee was called to meet during the State Fair, and met as above at the office of Dr. Cross, at seven o'clock, President Harris in the chair. Other members present, Wyman Elliot, D. W. Humphrey and the acting secretary. Prof. Edward D. Porter, of the State University; Treasurer, J. T. Grimes; A. J. Phillips and E. Wilcox, of Wisconsin; C. H. Greenman, A. W. Sias and Seth H. Kinney, being present by invitation, acted with the committee.

Prof. Porter being called upon stated in outline the plan for continuing the Farmer's Lecture course, organized and commenced last winter at the State University, and requested that some plan be devised to connect the Horticultural week of that course with the annual winter meeting of the State Horticultural Society. As the date of the Horticultural meeting was fixed by law and must occur on the third Tuesday in January, he was willing to begin the Farmers' Course a week earlier than was intended in order to effect the desired union.

After a full discussion it was agreed with Prof. Porter, and so voted that the week of the meeting of this society should be known as the Horticultural week of the Farmers' course; that the lectures engaged by him for the course should be delivered before the Horticultural Society, and be published, together with the debates following upon the subjects of each lecture, in the transactions of the society.

Prof. Porter said that he expected to have at least two lectures connected with Horticulture from distinguished writers from

abroad, one of which would be by Prof. C. V. Riley, Entomologist of the Department of Agriculture at Washington, on Insects injurious to Agriculture and Horticulture, especially with reference to those insects most seriously threatening these industries in the Northwest.

Wyman Elliot suggested that we ought to adopt a system of premiums to draw out essays upon some of the more important subjects for study in our society, and on motion it was voted to offer fifty dollars for the purpose at the next annual meeting, one-half the amount for an essay on orcharding in Minnesota, and the other half for an essay on the best methods of producing and cultivating improved seedling fruits. ■

It was also voted to offer premiums at the same meeting to the amount of one hundred and fifty dollars, to be divided as nearly as practicable as follows: seventy dollars on fruits, thirty on plants and flowers, forty on vegetables, and ten on Minnesota grown seeds. The premiums on collections or displays of fruits to be separate as between amateur and professional exhibitors, and where premiums are offered on single plates of named varieties to limit the collection to these varieties.

It was voted to procure a seal for the use of the society and Prof. Porter was requested to act with the secretary in making a suitable device for the same; and the secretary was further instructed to procure samples of diplomas and submit them to the society for selection at the annual meeting.

The secretary was instructed to make up a premium list and program for the annual meeting, and forward copies to members of the executive committee for their examination before the final issue of the same.

On motion the sum of twenty-five dollars was appropriated for secretary's incidental and office expenses, to be accounted for at the annual meeting, and orders drawn for same and for expenses of the members in attendance as follows:

No. 5.	Wyman Elliott, Minneapolis.....	\$6 85
No. 6.	D. W. Humphry, Faribault.....	4 00
No. 7.	Oliver Gibbs, Jr., Lake City.....	4 60
No. 8.	Secretary's incidental expenses.....	25 00
		<hr/>
		\$40 45

A vote of thanks was tendered to Dr. Cross for the use of his office for the meeting, and the committee then adjourned.

OLIVER GIBBS, JR.,
Acting Secretary.

ANNUAL WINTER MEETING, 1883.

The Sixteenth Annual Winter meeting of the Minnesota State Horticultural Society convened at the College of Agriculture, University of Minnesota, Minneapolis, on Tuesday, January 16, 1883, at 9 o'clock A. M. Vice President A. W. Sias in the chair, President Harris having been called away to the bedside of his mother who was lying ill in Ohio.

Henry C. Stearns, of Watseka, Illinois, was announced as assistant secretary and reporter for the session.

PROGRAM.

First Day, Tuesday, January 16th, 1883.

MORNING SESSION.

9 A. M.—Opening exercises:—Address of welcome by Prof. Edward D. Porter, Professor of Agriculture and Horticulture in Minnesota State University. Address of President J. S. Harris.

Reports of Secretary and Treasurer.

Appointment of committees for the meeting.

Paper on "Further Studies in Apple Blossoms" by Geo. P. Peffer, of Pewaukee, Wis.

Question box and general business.

12 M.—Recess, one hour.

AFTERNOON SESSION.

1 P. M.—Prof. Riley's lecture.

Discussion.

Paper on "Black Heart in Fruit Trees" by A. W. Sias, of Rochester.

Discussion.

Revision of Fruit List.

Question box and general business.

EVENING SESSION.

7 P. M.—Paper on "Experience in Strawberries" by Geo. J. Kellogg, of Janesville, Wisconsin.

Discussion.

Revision of Strawberry List.

Question box and general business.

Reading of Volunteer Papers.

Second Day, Wednesday, January 17th.

MORNING SESSION.

9 A. M.—Report of committee on Seedling Apples—S. M. Emery, M. Pearce, J. S. Harris.

Discussion.

Reading of Prize Essays on Seedling Fruits.—(See premium list.)

Discussion.

Paper on "Two Years in Orchardng," by A. J. Phillips, of West Salem, Wis.

Discussion.

Revision of Fruit and Ornamental Tree list.

Question box and general business.

12 M.—Recess, one hour.

AFTERNOON SESSION.

1 P. M.—Address on Market Gardening, by J. M. Smith, of Green Bay, President of the Wisconsin State Horticultural Society.

Discussion.

"A Discursive Paper containing some Facts," by Hortense Share, of Rosemount.

Revision of the list of Shrubs and Flowers.

Reading of Volunteer Papers.

Question box and general business.

EVENING SESSION.

7 P. M.—Reports from members of the General Fruit Committee.

Discussion.

Reports of delegates to other societies.

Discussion.

Report on Grapes, by C. H. Greenman, of Dover Center.

Discussion.

Reports of standing committees.

Question box and general business.

Third Day, Thursday, January 18th.

MORNING SESSION.

9 A. M.—Consideration of the following resolution passed at the annual meeting, 1882: "*Resolved*, That the Executive Committee be instructed to appropriate the sum of \$200 to be set aside for five years annually from the annual appropriation of one thousand dollars, and invested in interest bearing bonds, interest and principal to be devoted to a premium list with the object in view of increasing our list of hardy winter varieties of apples, under such restrictions as shall be deemed best by the Society."

Discussion and adoption of system of above premiums.

Reports of judges on exhibits.

Question box and general business.

12 M.—Recess, one hour.

AFTERNOON SESSION.

1 P. M.—Prize Essays on Orchardling—(See premium list.)

Discussion.

Secretary's Portfolio—Prof. Budd in Europe and his discoveries in Russia. Letters from Marshall P. Wilder, P. Barry, Prof. J. L. Budd, A. G. Tuttle, and others; notes, extracts, etc., etc.

Discussion.

Election of officers.

Question box and general business.

Payment of premiums.

EVENING SESSION.

7 P. M.—"Historical and Experimental notes on Potato Culture," a paper by A. S. Johnson, of Chili Station, N. Y.

Discussion.

"Notes on Insects"—Paper by R. J. Mendenhall, of Minneapolis.

Reading of Volunteer Papers.

Discussion.

Question box and general business.

Fourth Day, Friday, January 19th.

MORNING SESSION.

9 A. M.—Report of Finance Committee.

Report of Committee on President's Address.

Reports of other Standing Committees.

Discussions.

Question Box and Unfinished Business.

12 M.—Recess, one hour.

AFTERNOON SESSION.

1 P. M.—Subject for the afternoon, "Forestry and Ornamental Tree Planting." Paper by L. B. Hodges, of St. Paul. Discussion.
 Question Box. General Business.
 Location of Summer meeting and of next Annual Meeting.
 Final Resolutions.
 Adjournment.

QUESTION BOX.

A Question Box will be placed upon the Secretary's table, into which any written question or suggestion may be dropped, and its contents will be discussed and made a subject of record as one of the orders of business.

 PREMIUM LIST.

SUPERINTENDENT OF EXHIBITIONS—JAMES BOWEN.

FRUITS.

Best Display of Apples by Nurserymen,	Diploma.
Best Display of Crab Apples by Nurserymen,	Diploma.
Best Display of Apples by Amateurs,	Diploma.
Best Display of Crab Apples by Amateurs,	Diploma.

SINGLE PLATE PREMIUMS.

75 cts. first premium, 50 cts. 2d premium, on the following varieties by single plates—at least 5 specimens of apples and 8 of crabs to constitute a plate, and no entry to be entitled to a premium unless the fruit is shown in good condition.

APPLES.

Wealthy.	Pioneer.
Fameuse.	Jonathan.
Walbridge.	Pewaukee.
Ben Davis.	Minkler.
American Golden Russet.	Red Reinette.
English Golden Russet.	Hotchkiss Seedling.
Perry Russet.	Wolf River.
Allen Russet.	Dickerman.
Rollins' Russet.	Elgin Beauty.
Talman Sweet.	Wine Sap.
Forester's Sweet.	Haas.
Price's Sweet.	Scott's Winter.
Sweet Greening.	Hubbell.
Sweet Pear.	Magog Red Streak.
Westfield Seeknofurther.	Blue Pearmain.

Willow Twig.
Utter, Cooper, or Lucy.
Malinda.
Clayson.
Giant Swaar.
Rollins' Pippin.

Herfordshire Pearmain.
Pomme Grise.
Canada Black.
Peffer's Winter.
Alexander.
Roxbury Russet.

CRAB APPLES.

Minnesota.
Jewell's Red Winter.
General Grant.
Hutchinson Sweet.
Lake Winter.
Gilliflower Crab.
Meador's Red Winter.
Maiden's Blush.

Hesper Blush.
Virginia.
Akin's Striped Winter.
Quaker Beauty.
Orange.
Pride of Minneapolis.
Soulard.

SEEDLING APPLES.

Best plate new seedling apples for general purposes, \$5; 2d best, \$3; 3d best, \$2.
Best plate new seedling sweet apples \$3; 2d best, \$2; 3d best, \$1.

Entries on seedling apples must be accompanied by specimens of the wood of last three year's growth, and statement of age and location of tree and pedigree, if known. Label the cuttings securely for identification.

GRAPES.

Best plate, any variety, \$2; 2d best, \$1.

Judges will grade all fruits on size, color, form, quality and condition, marking on a scale of ten points.

PLANTS AND FLOWERS.

Best Display of Ornamental and Flowering Plants Diploma.
Best Floral Design, \$7.00; 2d best, \$5.00; 3d best, \$3.00.
Best Hand Bouquet, \$3.00; 2d best \$2.00; 3d best, \$1.00.
Best Pyramidal Bouquet, \$3.00; 2d best, \$2.00; 3d best, \$1.00.
Best Single Plant in Bloom, \$3.00; 2d best, \$2.00; 3d best, \$1.00.

VEGETABLES.

Best Display of Potatoes Diploma.
Best Display new varieties Potatoes never exhibited at a winter meeting, Diploma.
Best Display of Winter Vegetables, Diploma.

75 cents 1st premium, 50 cents 2d premium on the following varieties of potatoes by single plates, 5 specimens to constitute a plate; but exhibitors may show a peck of any variety if they wish to do so.

Early Vermont
Beauty of Hebron.
Early Ohio.
Clark's No. 1.
Gideon Seedling.
White Star.
100 Fold Fluke.
White Rose.
Chicago Market.

White Elephant.
Magnum Bonum.
Belle.
Burbank.
Tioga.
Jordan Prolific.
Brownell's Best.
Dunmore.
Vermont Champion.

Best $\frac{1}{2}$ peck White Globe Onions, 1st premium, 75 cents; 2d premium, 50 cents.

Best $\frac{1}{2}$ peck Red Globe Onions, 1st premium, 75 cents; 2d premium, 50 cents.

Best $\frac{1}{2}$ peck Weathersfield Large Red Onions, 1st premium, 75 cents; 2d premium 50 cents.

Best $\frac{1}{2}$ peck Yellow Danvers Onions, 1st premium, 75 cents; 2d premium, 50 cents.

Best Hubbard Squash, 75 cents; 2d best, 50 cents.

Best Bunch of Celery, 75 cents; 2d best, 50 cents.

Best $\frac{1}{2}$ peck Parsnips, 75 cents; 2d best, 50 cents.

Best $\frac{1}{2}$ peck Carrots, table use, 75 cents; 2d best, 50 cents.

SEEDS.

Best Display Minnesota grown Garden Seeds, \$6.00; 2d best, \$4.00.

SPECIAL PREMIUMS OFFERED BY WYMAN ELLIOT OF MINNEAPOLIS.

Best New Seedling Potato, \$10.

Best New Seedling Strawberries, \$10.

To be awarded at such time during the year 1883 or thereafter and under such conditions as may be agreed upon by vote of the society.

MISCELLANEOUS.

Best Display of Canned Fruits, \$3.00; 2d best, \$2.00.

Best Display of Jellies, \$2.00; 2d best, \$1.00.

Best Jar Mixed Pickles, \$1.00; 2d best, 50 cents.

Best Sample Home-made Vinegar, \$1.00; 2d best, 50 cents.

PRIZE ESSAYS.

Best Essay on the propagation and cultivation of improved Seedling

Fruits.....\$25 00

Essays competing for this prize are expected to give instruction in the best breeding sorts of tree fruits, cross breeding by hand fertilization of blossoms, choice of sorts for particular crosses, what sorts to depend upon for characteristics of tree and what for fruit, how to arrange a plant for cross breeding by distribution of pollen by winds and insects, care of young seedlings, the best stocks to graft them into for trial of fruit, and general care of seedling orchards; also in small fruits a few simple directions for the encouragement and guidance of amateurs

Best Essay on Orcharding in Minnesota.....\$25 00

The essay on orcharding will include the selection of site, preparation of soil, choice of varieties, general care and cultivation, pruning, budding, grafting protection from severities of seasons and from insects, harvesting and marketing of fruit, etc.

The above essays should be sent to the Secretary, or notice given him, before the date fixed for the meeting in order that a place may be reserved for them in the program, and are to be the property of the society, to be published at its discretion.

Competition on premiums for fruits, flowers and vegetables is open to growers in Wisconsin, Iowa and Dakota on same fruit belts as Minnesota, and on prize essays has no limit.

OLIVER GIBBS, JR.,

ACTING SECRETARY, Lake City, Minn.

The annual address of President Harris was then read by W. J. Abernethy, and was as follows:

PRESIDENT'S ANNUAL ADDRESS.

Gentlemen of the Minnesota State Horticultural Society:

Once more we have come together in annual meeting for consultation, a friendly conference upon the experience of the past, and to lay plans and devise ways for improvement and progress in the future. We have good cause for congratulation in the progress we have made in the past and equal cause for being grave and earnest in meeting and discussing the great questions in Horticulture that are exciting interest at present or will arise in the future. Some of these questions are: Shall our beautiful prairies be made more beautiful by being dotted over with groves and forests of deciduous and evergreen trees to mollify the temperature, break the strength of blizzards and impart humidity to the atmosphere, or shall they be cropped with wheat until their owners can no longer eke out a miserable existence and then be abandoned to become barren wastes? Shall the homes of our farmers be only places of shelter with bleak surroundings, or shall they be true homes situate in the midst of landscapes beautiful to the eye and cheering to the heart? Shall we have an orchard and garden upon every farm and raise our own fruit—fruit for our families, fruit for the denizens of the cities, and fruit to load our steamboats and cars to export to other markets, and thus swell the volume of our commerce—or shall we raise more wheat, rising early and toiling late, that we

may have some hard-earned profits to send to other States, and receive in return a meager supply of stale, unwholesome fruit of their surplus? Shall we plant in our cemeteries the sweetest flowers and loveliest plants, making them to vie with the Vale of Cashmere—"with its roses the sweetest that earth ever grew"—making the last resting place of our loved ones like the ancient Eden, "planted with the trees of God," or shall we let them remain desolate, grown o'er with briars and weeds, a fit resting place for those only who have no faith or hope of Heaven? Shall every home in all this State have its library, its music, its flowers, its pleasure grounds and everything that is calculated to inspire men to lead virtuous lives and perform noble deeds? These are among some of the ~~new~~ questions that will come up before us from time to time, and ~~it is~~ for us to solve them favorably and thus wield a mighty influence in molding the character of our State. We have now entered upon the 17th year of our existence. Born in a period when repeated failures in fruit culture had caused hope to die out and raised up an army of croakers, it is almost a wonder that it lived through the years of babyhood; but survive it did, and down there at its birthplace it began to exert an influence for good from the very start, in causing orchards to be planted and home surroundings improved, and that part of the State is now far advanced in fruit growing and produces thousands of bushels of apples and tons of grapes, and the farmers' homes begin to exhibit an air of comfort and plenty. Then the noble hearted Minneapolis saw that we were determined to live and had faith in ourselves, beckoned us to come up and share her princely hospitality; and we came and waxed stronger, and one by one we have laid low the *croakers* and buried them deep under piles of Duchess and Wealthy apples, and built conservatories and laid out gardens over their graves, and there is no hope of their resurrection in store for them. If there are any of them left let them be warned quickly and repent and be converted before they are hopelessly lost. Then, armed with Wealthy apples and a lot of promising other varieties, we had the audacity to make a raid upon our honorable legislature, and captured it, too. Among the spoils of the victory are an annual volume of transactions, an experimental farm on the shores of Lake Minnetonka, and a little money to help us fortify for the great battle that is soon to be fought, and where we shall come off more than conquerors, having mastered the vicissitudes of climate and given our State a list of hardy fruits to supply every want and satisfy every desire the whole year around. This is no fancy sketch or idle dream, but

is the outgrowth of an organization started by a dozen fanatics. It is now a proud privilege to be able to call ourselves citizens of Minnesota and members of the State Horticultural Society. What will it be when we have fulfilled our mission! Minnesota, the bright North Star State. There will be no occasion for exaggeration when I speak in her praise. There is no State in all the Union that to-day offers such unsurpassed inducements to the farmer, merchant, mechanic, professional man, and all others who seek a new home, to settle within her borders. Her climate is stimulating in its effects, and well calculated to bring men and fruit to their greatest state of perfection. Her water is pure and abundant. Her people, in intelligence, industry, progression and civilization are not surpassed in any land. She has a soil equal in variety and fertility and natural adaptation to fruit culture and the producing of almost everything required by civilized man, to that of any other State, in the Northwest, and a purity of atmosphere that promotes health and vigor to man and beast, and with a surface so varied in its character that thousands of locations can be selected with special adaptation for growing the different kinds of products in their greatest perfection, and *it will do it, too*, when this society has fulfilled her mission and all of the people are educated in the art and science of horticulture. She has her State University, where the farmer's and mechanic's sons and daughters may acquire a complete education at an expense so nominal that but few of our people are so poor they cannot afford it. She has in connection with it an agricultural college in complete working order, where our sons may learn everything that pertains to scientific and practical agriculture and horticulture. It has in connection with it ample grounds for experiment and the trial of every variety of grain, fruit, flowers and vegetables that are profitable as a source of wealth or a source of comfort and enjoyment to the people, and which affords facilities for testing the best methods of cultivation, and the most economical kind and manner of applying fertilizers. She has an efficient and complete system of common schools, which brings the opportunity to acquire a liberal education to every man's door, and there remains no excuse for ignorance to be found in the next generation. And she has the press, the "power that stands behind the throne," the greatest educator and civilizer the world has yet produced. Almost every county has one or more weekly newspapers, and our morning dailies equal those of the metropolitan cities of the East, while our agricultural weeklies are worthy of a most liberal support. Then there are

the Normal schools that turn out teachers by scores; and the complete system of railroads that carry our surplus products to other lands and pour wealth into our purses.

Gentlemen: excuse me for occupying so much of your time. We have before us a programme framed upon the urgent necessity of the times, and I expect it will draw out the experience and observation of members, and that you will be able to satisfactorily dispose of questions that are of vast moment to us, and to thousands of people in this and adjoining States. While we remember that the year just ended has been a prosperous one for our farmers, and has witnessed a remarkable increase in the wealth and population of our towns and cities, and large additions to the area of land placed under cultivation, we should also remember this increase in population is making new demands upon us, and calls for a like increase in horticultural products, and if we do not raise them, they must be imported from other States, at the loss of the profits of production, the expenses of transportation, and the cost of supporting an army of middle men or dealers; three items that would reward us for considerable labor. Permit me to notice a few of the products that are wanted in larger supply. There remain no doubts on the question of small fruits. The strawberry is at home with us, and its cultivation in quantity for shipment to more southern points might be made very profitable, while at the present time there are not more than one-half enough produced to satisfy the demands of the home markets. A hardier late variety that will bear shipping is very much wanted. Currants do well in every part of the State, yet the demand is so much in excess of the supply that the selling price is getting higher each year. Raspberries, and especially the Black Caps, ought to do well here. The demand for them is so great that this society will be warranted in giving them a little attention, and if we have not already suitable varieties, to encourage the improvement of our native species, and the originating of some new and better varieties. The experience of the last season would indicate that some varieties of blackberries may be profitably grown when we better understand their treatment. As we are out of the latitude for growing peaches, and they can never be furnished to us so cheaply as to come within the means of the ordinary citizen to use more than as a luxury, the blackberry which is in season at the same time with the peach, will find in it no competition, and may at least, partly supply its place, and yet, never become so low in price as it does sometimes in the East, in good peach seasons, as not to pay the cost of production.

The Snyder variety is the best known in this State, and is productive and very good. It may not prove hardy enough for some localities. The Stone's Hardy comes to us recommended as more hardy and equally desirable in every other particular. The low blackberry, Dewberry, (*Rulus Canadensis*) is indigenous in the eastern part of the State. The fruit is as good, and it ripens a few days earlier than the blackberry, and is one of the native fruits which we should attempt to improve and domesticate. The Concord and Delaware, and some other grapes are doing well in this State. The first is pronounced to grow larger, better, and less foxy than in any other part of the country. Our State has thousands of good locations for vineyards, and grape-growing may be made a very profitable industry. The fruit stands next in importance to the apple. The planting and management is simple and easily learned, and may be made very inexpensive, and much of the labor in their management is light and may be performed by old men, invalids, and women. There is great need of an earlier variety than the Concord, and of one that will keep later in the season. This creates an opening for experiment, both with seedlings from the standard varieties grown here and in ameliorating and improving our native species. This subject should occupy at least one session of our meeting, and, as there seems to be no place for it in the program, I would suggest the offering of a prize to bring out essays upon the subject for our next Summer or Winter meeting, also that when we adopt a system of premiums for the originating of new hardy fruits, that we include one for grapes.

We have growing in various sections of this State fine varieties of the native plum. Some of them are of large size and superior quality, nearly equaling the tame plum (*Prunus domestica*). I believe it to be susceptible of such improvement as will place it in the front ranks among our fruits, and might, perhaps, be made to take the place of the prune, and perhaps the peach. I have no knowledge of any efforts being made in that direction farther than to remove some of the best from the forests and transfer them to the garden. We want such a man as Ephraim W. Bull, of Concord, Mass., who will pursue such a course with them as he has with the native wild grape, giving to the world the Concord grape.

The apple and the apple tree will occupy its usual space in this meeting, therefore I need not take up your time with them. It is to be hoped that some of the essays competing for the prize may impart information that will give orcharding a new and better

start. The subject of hybridizing and originating new varieties is the most important one that can come before us at this time, and it is to be hoped that, in connection with the premiums for the best new varieties which this society proposes to offer, we shall awaken an interest and start experiments in every part of the State. I believe that the originating of one single variety that will keep until May, and is as large, handsome and good as the Wealthy (and that is hardy and productive everywhere), would be worth millions of dollars to this and adjoining States, and the man who originates it will occupy the highest place in the history of Horticulture, as Washington does in the history of our country.

EXPERIMENTAL STATIONS.

I have often spoken to you of the importance of locating some experimental stations. There ought to be at least three in the State under the direct supervision or control of this society, places where we may conduct experiments in raising seedlings and where we can test and quickly make known the result of every new variety of fruit or tree that is a candidate for favor before we recommend it for general trial by the people—by that method we would much sooner ascertain whether they had merit, and it would save large sums of money that are now expended for novelties that have no value. No doubt it would be a wise investment on the part of our Legislature to make an annual appropriation sufficient to defray the expenses of such stations—but we can hardly ask it at this time as the State is already expending a liberal sum for such a purpose, but unfortunately for us where we can have no voice in its management. We, as a society, are too poor to prosecute the enterprise and must therefore, for the present, depend upon volunteers in that direction. Some of our nurserymen have expressed a willingness to propagate enough of the new seedlings to give them a trial. Unless we can decide upon something practical, would it not be well for this society to designate some of them or even all of them and authorize the Seedling Committee to place in their hands cuttings and scions of such varieties as they deem worthy to be propagated under such rules as will prevent the monopoly of any one variety that should prove valuable? There may be one other opportunity open to us, and my idea is that under present circumstances we can do no better than to make overtures to those who have authority over the State University farm asking them to set apart a suitable portion of the farm and direct that such

a system of experiments shall be inaugurated and conducted by them to be in sympathy with the State Horticultural Society. The new farm is well located for that purpose, and as that is a State institution and receives annual appropriations to defray the expenses of conducting all beneficial work, this could be done without any special legislation. If the project should be carried out, it would add greatly to the interest and usefulness of the institution in providing a place where the students in agriculture and horticulture may have opportunity and facilities for demonstrating the practical working, or rather proving the value of a thorough scientific education. The young man who intends to make horticulture the business of his life, will always find it to be of great advantage to be thoroughly educated in the business, and after he has mastered everything contained in the literature his education will still be incomplete without it is accompanied with practical illustrations. The present incumbent of the agricultural chair is in my estimation just the right man to direct such an enterprise, and in my opinion he would most heartily undertake the testing of a limited number of our best seedlings and to conduct some experiments on scientific principles in selection of seeds and hybridizing with the view to originating that new, hardy, handsome, good long keeping variety that we have talked of so much and looked for so anxiously. We have no right as a society to dictate or in any way interfere in the management of the farm, but as citizens of Minnesota we may petition those in authority on matters that pertain to the public welfare. I would suggest the appointment of a standing committee whose first duty it shall be to confer with the Regents of the University and the Professor of Agriculture upon this matter and if it is put into practice to visit the grounds at least once each season and report at each annual meeting the progress being made in the work. If we succeed in making the arrangement I trust that all members of this society will take enough interest in the work to stand ready to lend aid and encouragement by looking up scions, and saving seeds from the hardiest grown fruits.

We have nothing tangible in the shape of a home. We very much need a place that we can call headquarters of the society and where we can safely keep our property. We have some surplus copies of past volumes of transactions that will some time be of great value to us. I have directed that they be temporarily stored at this place. We are also getting, in exchange, reports from other societies, and if we had a place to set them up they would form the

starting point for a library. Now, it seems to me that we ought no longer delay the starting of a library and in connection with it a museum, where should be collected and kept everything that is interesting and useful in our horticulture, as we cannot at present erect suitable rooms for the purpose. Will it not be advisable to create a committee to confer with the Governor of the State or with the Regents of the University to ascertain if we can have the use of rooms at the Capitol or in the College of Agriculture to use for that purpose. If we cannot have rooms in one or the other place we should, as soon as practical, take steps towards building a Horticultural Hall. Our last volume of transactions is not entirely satisfactory to us. It should have been published and distributed within ninety days after the adjournment of the annual meeting, and the matter is crowded into much too few pages to make an attractive book. It is lacking also in some features which we may be able to correct in the future that would add greatly to its usefulness. I refer particularly to a Secretary's portfolio and a department on Entomology. I believe that our Secretary-elect, Mr. Hollister, intended to introduce the Portfolio after the form of the Michigan and some other Societies, but business called him out of the State at an unfortunate time for us, and when the present acting-secretary was appointed it was too late to do more than get our manuscript into the State Printers' hands. I do not believe that our Legislature intended to appropriate for the purpose a sum inadequate to cover the expense of printing 300 pages therefor. I recommend the appointment of a committee on printing to ascertain the cost of printing 300 pages, in accordance with the Act of 1881, Chapter 72, General Laws, and if it should be found that \$750 is inadequate to cover the expense that we ask of the present Legislature an additional appropriation sufficient to meet the entire cost.

ENTOMOLOGY.

Insects are continuing to commit their ravages in this State and each year are becoming more destructive. The Horticulturists are suffering severely. Wormy fruits are the rule and fair fruits the exception. Their trees are frequently defoliated by caterpillars. Beetles and moths have combined against us, and we want more information about them, that we may be able to recognize our enemies, and know how to head them off. I suggest that this society elect an entomologist, and that it be a part of his duty to compile and report matter upon the subject to be published in our annual

report, in amount not to exceed 30 pages, and that we appropriate the sum of——dollars to procure cuts for illustration and to defray other expenses attending the same.

It is time that we publish a catalogue of the fruits grown in this State. The work of compiling will be best left for a committee.

IN MEMORIAM.

I am not aware that death has taken from us any of our members since our last meeting; but among the illustrious dead of the year, I have to record the names of two men, whose labors have been largely for the benefit of farmers and horticulturists, Charles Darwin and James Vick. Charles Darwin, who died at the ripe age of seventy-four, was considered the greatest horticulturist of the age. He was the author of many valuable works. We have nothing to say of the conclusions to which he came in prosecuting his investigations above all others. His "Plants and Animals under Domestication, Movements of Climbing Plants, and Crops and Self Fertilization in the Vegetable Kingdom," endear him to the progressive horticulturist. James Vick, who died at Rochester, N. Y., May 16, was aged about 64 years. The *Gardners' Monthly*, in announcing the event says: "James Vick is dead! Sadder words than these, my pen could not utter. Wherever a flower is grown in this broad land, there will be hearts touched with sorrow, at this mournful news." Although English by birth, he was truly an American horticulturist, and his name had become a household word, through his genial quality and his devotion to horticulture in all its departments. At the time of his death he was at the head of one of the largest seed establishments in America, and his *Floral Guide* had a circulation of over 200,000 copies. His success has been marvelous. His labors are finished, but the good he has done will endure forever

THE AMERICAN POMOLOGICAL SOCIETY.

The next meeting of this society will be held in Philadelphia, probably in September. We ought to be represented and make a show of fruits at that meeting. If it meets your approbation it remains with you to designate delegates to attend. Permit me before closing to just allude to the last State Fair held at Rochester. The exhibition of apples was the largest ever called out in this State. The Fair was a few days too early to bring about the best results in winter varieties, they being unripe and not well colored

up, while grapes were so green as to be unfit to be shown. The whole number of enteries in the first department was, fruits, 649; flowers, 68. The awards amounted to, fruits, \$349; flowers, \$130. An encouraging feature of the exhibition was the number of new exhibitors among the amateurs. There are many serious defects in the premium list; it draws out an endless number of poor, scrawny, unknown varieties, which being mixed in with the good destroys the effect of the whole and is a confusion to the viewing committee, and does not give prominence enough to the really good and fine varieties. The only really valuable feature of the exhibition was in the competition upon single varieties. The time has arrived for inaugurating reform. We want a premium list that will draw out the greatest competition upon the really good varieties best adapted to this State, and that will clear the tables of the 101 varieties of apples and crabs that have nothing to recommend them, only as each counts one in the contest on numbers.

In concluding my remarks, gentlemen, permit me to once more thank you for the many expressions of respect you have shown me in all our past intercourse together, and for the honors you have conferred upon me. While my life is spared my greatest pleasure will be in using my feeble efforts to promote the welfare of this society and the happiness of the people of Minnesota. May all our relations in the future as in the past be fraternal. May we all be able to so far forget ourselves as to be willing to appreciate others and do justice to them. May the progress of horticulture, rural improvement, domestic comfort, and cultivated taste, which is being developed by this society, continue to progress onward until all of our people shall have enough and to spare of this most perfect and useful gift of Divine beneficence to man, fruit, fruit and flowers, forever.

RESPONSE BY PROF. PORTER.

Prof. Edward D. Porter, of the College of Agriculture, University of Minnesota, responded to the address of President Harris as follows :

Mr. President and Members of the Minnesota State Horticultural Society :

In behalf of the Regents of the State University, and also in the name of the citizens of Minneapolis, I am happy again to have

the privilege of extending you a cordial welcome to these halls and to the homes of the citizens of our city. Minneapolis has a friendly interest in all the societies organized to improve the industries of our noble State, but more especially in this and other meetings here, and in which many of its leading citizens are active workers in the ranks. It is especially gratifying to me, as the head of the Agricultural College, to have these constituencies, that I may meet them here, face to face, at least once a year for advice and counsel in the educational and practical work of the college, particularly in the management of its experimental farm. A room has been fitted up in this building for the use of your society, librarian and committees, and this hall will be at your service for your meetings whenever it shall be your pleasure to hold your meetings here, or so long as you may wish to make the building a place for the safe keeping of your books and property. Again I bid you a cordial welcome and wish you a pleasant and profitable meeting.

Prof. Porter announced that by reason of the frequent calls upon the chiefs of divisions in the Department of Agriculture at Washington, to go out and lecture before societies in different parts of the country, Commissioner Loring had issued an order forbidding them to accept such invitations, and that in consequence Prof. C. V. Riley would not be able to attend the meetings of either the Horticultural Society or the Farmer's Lecture Course.

RESPONSE BY PRESIDENT SIAS.

In behalf of the members of the State Horticultural Society I most heartily thank the President and Faculty of the University for the cordial welcome given us at these halls. We esteem it a great privilege and pleasure to hold our meetings at this place. We are also under renewed obligations to the other citizens of Minneapolis for the cordial welcome to their beautiful city, to their homes and firesides, and to all of which we say, please accept our hearty thanks.

We will now proceed with the regular order of business, and will listen to the reading of the secretary's report.

SECRETARY'S REPORT.

Mr. President and Fellow-members:

Secretary U. S. Hollister was called away from the State on business in the latter part of April. Soon afterwards he sent to me from Nashville, Tennessee, his manuscripts for the volume of Transactions for 1882, together with some of the portable property of the society, and a receipt from A. L. Larpenteur, of St. Paul, showing a storage there of the cases of books, pamphlets, etc., constituting our library; and, on the 1st of June, at a meeting of the Executive Committee at Minneapolis, I was appointed Acting-Secretary for the remainder of Mr. Hollister's term of office, which expires at the close of this meeting.

Upon consultation with Prof. Porter, he kindly offered to furnish storage for the cases of books at St. Paul, and they were transferred to the building occupied by the College of Agriculture at the University of Minnesota, where they now remain free of expense to the society, in a room provided with library and office conveniences, fitted up expressly for our use.

I have made a catalogue of the books, etc., contained in the cases referred to, which is herewith presented, and from which it will be seen that, after making a liberal allowance for the future wants of the society in supplying back numbers to members and exchanges, we still have on hand a considerable surplus of our annual reports, and I hope you will devise some plan for their early distribution and instruct the secretary accordingly.

If the books are to remain in their present quarters, I would recommend that some person connected with the State University be appointed as librarian and allowed a reasonable compensation for

taking care of them and mailing our transactions from time to time under the direction of the secretary.

The list is as follows:

CATALOGUE "F."

Transactions Minnesota Historical Society 1866 to 1873, combined, 276 copies, cloth.

1874, 506 copies, paper.

1875, 140 copies, paper.

1876, 35 copies, cloth, 747 copies, paper.

1877, 66 copies, cloth, 565 copies, paper.

1878, 48 copies, cloth, 194 copies, paper.

1879, 30 copies, paper.

1880, 167 copies, cloth.

1881, 403 copies, cloth, 1,265 copies, paper.

1882, 1,000 copies, cloth, 2,000 copies, paper.

Transactions Michigan Pomological Society:

1870, 1 volume.

1876, 2 volumes.

1871, 1 volume.

1877, 5 volumes.

1872, 1 volume.

1878, 2 volumes.

1873, 1 volume.

1879, 4 volumes.

1874, 1 volume.

1880, 10 volumes.

1875, 1 volume.

1881, 10 volumes.

Transactions Michigan Board of Agriculture, 1870 to 1877 inclusive, 1 volume each.

Transactions Illinois Horticultural Society, 1868, 1869 and 1871 to 1874 inclusive, 1 volume each.

Transactions Kansas Horticultural Society, 1869 and 1872 to 1874, inclusive 1 volume each.

Transactions Wisconsin Horticultural Society.

1871 to 1874, inclusive, 1 volume each.

1878, 2 volumes.

1878 and 1879, 2 volumes.

1879 and 1880, 3 volumes.

1880 and 1881, 6 volumes.

Transactions Vermont Board of Agriculture.

1878, 1 volume.

Report of United States Department of Agriculture.

1876, 1 volume.

Transactions Illinois Board of Agriculture.

1876, 1 volume.

Pomology of Maine.

1873 and 1874, 1 volume.

1875 and 1876, 1 volume.

Transactions Montreal Horticultural Society.

1876, 1 volume.

1877, 6 volumes.

Transactions Western New York Horticultural Society.

1874 to 1877, inclusive, 1 volume each.

Transactions Nebraska Horticultural Society.

1871, 1 volume.

1872, 1 volume.

1877, 1 volume.

Transactions Worcester County (Mass.) Horticultural Society.

1878, 1 volume.

Fruit List of the Province of Quebec.

Transactions Massachusetts Horticultural Society.

1865 to 1873, inclusive, 1 volume each.

Parts 1 and 2 of same for 1874 to 1878, 1 volume each.
1848, 1 volume.
1852, 1 volume.
Address by Marshall P. Wilder, 1875.
Transactions Iowa Horticultural Society.
1879, 2 volumes.
1880, 1 volume.
1881, 3 volumes

LOCAL HORTICULTURAL SOCIETIES.

One obstacle in the way of the usefulness of this society is the want of a really practical method of communication with the people of the State most interested in our work, and most needing the benefit they might receive in reading our reports. Our membership is inadequate for this purpose. We have less than a hundred active Minnesota members, and they are all in no more than fourteen counties, and of the five thousand copies of our reports annually printed, the members themselves do not receive over three hundred for themselves and for what distributions they make in their several localities, all told. There is at present but one county horticultural society receiving the reports—that is the one in Lyon county; and as to county agricultural societies, I am unable to ascertain, after applying to the secretary of the State Agricultural Society for the information, whether there are any of these organizations entitled to or desiring to receive them. We send out under the law about 200 copies to the newspapers of the State, one to each paper, 100 to the State Agricultural Society, 500 to the State Board of Immigration—which are presumed to mostly go to foreign parts—50 to our lone sister of Lyon county aforesaid, 500 to the State officers and the legislature, about 300 as aforesaid to the members of the society, and the rest to various newspapers and persons supposed by the secretary to be entitled to them or known to want them, or applying for them, making in all not over 2,000 copies. There are no regulations of the society, that I am aware of, governing the distribution, and it will be seen by a little study, that under the present system—or rather want of system—there are really but few of the farmers and gardeners of the State who ever see our reports, or know upon what terms they can obtain them. It is no remedy for this unhappy state of facts, to say that the people might have the reports if they would take enough interest to join the society, or even apply for them. That may be very true, but it does not get the reports into circulation. It seems to me that it is our business to find out some way to get them into the people's hands. We are the guardians of the horticultural interests of the State. The legislature has made us

so, by our act of incorporation, and has appropriated the public money to our use for the purpose; we have accepted the trust, and must execute it. How shall we distribute the valuable information on horticulture that we collect annually in our papers, discussions, correspondence, and reports, so as to arouse an interest among the people at large, and do them the most good? It is not for me to answer this question alone; but I would suggest that for one thing, some practical plan be devised for organizing town and county horticultural societies, and as an inducement to the people, to take hold and keep alive such societies, that we offer our reports free of charge from year to year to the members of all such societies that will make us an annual report of their doings, and send one or more delegates to our annual meeting each year. I am not sure but that the most efficient means to this end, would be for one year at least, to adopt the traveling lecture system, in use by other societies, and send out some one to call meetings and talk to the people about Horticulture, and assist them in getting their local societies started. In some States in the West, in all for aught I know, whenever there is Horticultural missionary work to be done, the railroads extend their aid by granting free passes for the necessary traveling for this purpose, on their lines; and probably the whole-souled corporations doing business on the rail in Minnesota, would willingly do their share in the work proposed. Transportation and expenses provided for, the society, would I presume, not have to look long nor far, for some one or more, public spirited and competent member or members, to go out, at least on invitation from localities, on such recruiting service. In the Michigan transactions for 1881, I find reports from eighteen auxiliary local societies, and in the Kansas, Iowa, Wisconsin, and Illinois transactions, for the same year, a large space is occupied by proceedings of local societies.

AMERICAN POMOLOGICAL SOCIETY.

The president in his address has recommended that this society take measures to send delegates to the meeting of the American Pomological Society at Philadelphia, in September next. If we are to have the fruits of Minnesota on exhibition there in creditable shape and variety, it will be necessary to send out a committee to gather up selections, and get them together. If the coming season should be favorable for fruit, we can by that means exhibit nearly or quite one hundred varieties of the apple and fifty of the crab, and an extensive list of lovely grapes, and demonstrate the possi-

bility of fruit raising here, and that Minnesota cannot be beaten in the United States for the beauty and high quality of its fruits. This, it seems, would be of immense pecuniary advantage to the State in the encouragement of emigration, and gratifying to the pride of its people, sufficient to justify the legislature in making a special appropriation for the purpose. The legislature of Michigan appropriated one thousand dollars for a display of its fruits at the Boston meeting in 1881, to be expended under the direction of the Governor, and a committee of five gentlemen, headed by President Lyon of the Horticultural Society of that State, was appointed by the Governor to gather up such an exhibition as they deemed best and take it forward to the meeting. The State was divided into districts, and a collection of fruit obtained that carried off the highest honors. We cannot of course expect to compete with Michigan in number of varieties, but we can challenge the world to excel such as we do raise, and can now silence the taunt "you can't raise fruit in Minnesota!" and do it effectively, if the legislature will provide means to pay the necessary expenses.

THE REPORT FOR 1882.

The president has alluded to the unsatisfactory appearance of the volume of transactions for 1882. The use of so much fine type was occasioned by an overestimate made by the State Printer as to the number of printed pages that Secretary Hollister's manuscript would fill, and an apparent necessity for crowding the matter in consequence. A careful estimate need not vary materially from the actual space required, and one such occurrence as this cutting down of our report and introduction of fine type for the body of the matter may be a good hint to future secretaries to make their own count and to request of the public printer that he give us a book that will be more comfortable for the eyes of the old folks.

The manuscript was furnished to Mr. Cunningham immediately after my appointment as acting Secretary, and with the exception of two days' delay in one case the corrected proof sheets were returned to him by the first mail after their receipt. The first copies of the work in paper covers were furnished in November and those in cloth binding are but just received.

IMPROVEMENT IN STYLE—AN EARLIER ISSUE FOR 1883.

In regard to an earlier publication hereafter, the public printers for this year, 1883, Johnson, Smith & Harrison, of Minneapolis,

inform me that they can print our transactions in long primer type and make a volume of 300 pages, the limit of the law, by reducing the number of bound volumes from 1,000 to 300 or 500, and get it out by the first of April.

A LARGER REPORT NEEDED

On account of our prize essays, and the fuller report of discussions that will be taken at this meeting it may be necessary to issue a larger volume, probably 500 pages, and the law ought to be amended so as to allow us this as a maximum number of pages annually to correspond with our increasing business, and it should also be amended so as to authorize the binding of the entire edition in cloth, as is done in all the other Western States.

A consideration of this subject is earnestly recommended, that we may not find ourselves restricted or crippled in our work at this important stage of our career.

HOW THE PROGRAM WAS MADE.

A new departure has been made this year in the manner of getting up the program for the annual meeting. The views of the Executive Committee were first obtained by correspondence and other sources of information, then the program was made up by the President and Secretary, acting together, printed, and copies sent to the several members of the committee for revision. After their examination of it, as a whole, it was sent back to the Secretary with notes of such alterations and additions as the members desired, and then completed so as to suit the preferences of the committee as nearly as possible without calling them together; and thus, when finally printed for public distribution, it had received decided improvements, and was in shape to offer an attractive bill of fare for the meeting. The plan is worthy of future use.

In the extensive correspondence of the Secretary there accumulates and goes into his files a mass of facts and suggestions that, if carefully edited and printed with the Society's Transactions, may, together with such notes as he can make from time to time in the reading and observation that come naturally in his routine of work, be of much practical benefit to those who read our reports. Many difficulties in the way of the novice in Horticulture, or the amateur, that puzzle and put him off in his growing of trees and plants can be obviated by hints so picked up in reference to the practice of others who have encountered like difficulties. It has been a pleasure

to me in the short time I have acted as Secretary to draw out these things in my correspondence, often writing repeatedly to the same persons till the clue first given was fully followed out, and the materials so obtained have been embodied for the society in one form and another, but mainly in what I shall call the "Secretary's Portfolio," after the manner of Secretary Garfield in the Michigan Reports, and it will be furnished for publication if deemed desirable of the society. I am glad to find that the prominent Horticulturists to whom there has been occasion to write for information are found free to communicate all the aid in their power; there is an eager ambition to acquire and to extend knowledge, among, in fact, all the thoughtful men and women in the profession, and some of them are devoting their lives, not as martyrs, but as enthusiastic students of nature's school, to the solving of the great problems upon which depend the successful horticulture of the future, working gladly from the love of the work—and some of them, like Agassiz in zoological science, having no time to make money. All honor to such men as Wilder and Warder, and their younger brethren on the heights! Their works will be their honorable and lasting monument, for they will be read in trees and plants when marble shafts erected to the memory of man shall have crumbled into dust.

At the meeting of the executive committee held at Rochester in September last, Prof. Porter and myself were appointed a committee to arrange a device for a seal for the use of the society and to procure samples of blank diplomas to be shown at this meeting for selection of one deemed most suitable by the society. The committee have only progress to report at present; but on Prof. Porter's next trip East he will make some further investigations, and it is hoped that a suitable diploma can soon be obtained, and a seal furnished in time to show its impression on the face of the annual report for this year.

FINANCIAL STATEMENTS.

At the present writing I have not received from Secretary Holister any formal report of receipts, disbursements, and orders drawn, but presume they will appear in the Treasurer's report covering all transactions up to the date of my appointment as acting secretary. Since that date I have received and paid over to the treasurer—

Annual membership fees.....	*\$ 20.00
Drawn orders in his favor on State treasurer, July 1.....	500.00
Drawn orders in his favor on State treasurer, December 16.....	500.00
	<u>\$1,020.00</u>

Orders for disbursements have been drawn on Treasurer J. T. Grimes, as follows:—

June 1, Wyman Elliott, cash advanced for expenses meeting of executive committee, including express charges, \$1.35, paid by society.....	\$27.85
14, C. E. Young, printing.....	11.50
14, Appropriation for secretary's incidental expenses.....	25.00
14, Secretary's salary, second quarter.....	50.00
28, President's traveling expenses.....	7.00
Sept. 6, Wyman Elliot, expenses executive committee.....	6.85
6, D. W. Humphrey, expenses executive committee.....	4.00
6, O. Gibbs, Jr., expenses executive committee.....	4.60
6, Appropriation for secretary's incidental expenses.....	25.00
Dec. 9, Secretary's salary, third and fourth quarters.....	100.00

And at the Summer meeting, June 28, there were certified to the treasurer the following amounts for payment in premiums:—

On Fruits.....	\$42.00
On Plants and Flowers.....	34.00
On Vegetables	10.50
	<u>\$86.50</u>

An itemized list of the premiums appears in the record of the meeting.

The secretary's office and incidental expenses, of which a bill of items is herewith furnished, is summarized as follows:

Postage, envelopes and wrappers.....	\$24.38
Stationery.....	1.70
Express charges.....	6.25
Traveling expenses.....	17.05
Printing.....	16.50
Storage of books, St. Paul,.....	3.90
Miscellaneous, sundries.....	5.55
	<u>\$75.33</u>
Appropriations for same above stated.....	\$50.00
Due acting secretary.....	<u>\$25.33</u>

The expenses of distribution of our reports belonging partly to our State appropriation, and partly to the State printing fund, the entire distribution was turned over to me by the Secretary of State, and the sum of \$25.00 furnished to apply on the same, which has been disbursed for postage, etc., in addition to the office expenses above stated.

Our program for this meeting is full as printed except as to the lecture by Prof. Riley, from the Farmer's Course. All the other

*\$5.00 paid after treasurer's report was written.

papers, addresses, etc., will be ready at the appointed time, and of prize essays we have, up to the present time, seven entries for orcharding in Minnesota, and one on propagation of seedling fruits.

At the time the program was made up our executive committee were not aware or had forgotten that the Amber Cane Association had adjourned to meet at the same time and place with us this year. As we are now situated, both bodies being here, it may be thought desirable to arrange one joint session or more. To accommodate this, we have a number of papers that may, if necessary, and if so decided by the society, go into the files for publication without reading, but I would recommend that the society make its own selection from the list for consideration at this time.

Respectfully submitted,

OLIVER GIBBS, JR.,

Acting Secretary.

Mr. Brimhall moved the adoption of the secretary's report.
Carried.

The secretary. Our worthy brother D. W. Humphrey, of Faribault, member of the executive committee, and who in his connection with the society has been faithful to every trust, is now and has been for some time confined to his house by disease of the heart, so severe as to incapacitate him from any further duty than to think of us and send his good wishes. I have a letter from him which I would like to read. The letter being called for, was given as follows:

LETTER FROM D. W. HUMPHREY.

FARIBAULT, Jan. 15, 1883.

Oliver Gibbs, Jr.,

DEAR SIR.—I am still here and comparatively comfortable. I should have been much pleased to have met with you this time, but it is not at all probable that I shall ever again even walk around as I have been wont to do. My heart is in such condition I can make very little exertion; can walk only five or six steps with great care. The pulse only 37 to 40 or so, and no prospect of being any better. The end may come at any time and yet I may last for weeks.

I shall think much of you at your present meeting and shall read the reports with interest. I had intended to prepare a paper urging the cultivation of the grape by *everybody*, as one of the most delicious and healthy of fruits and one the easiest cultivated, and giving the quickest and surest return for time and labor spent. But my writing days are nearly over, and I was not able to even prepare a short article.

Wishing you a pleasant and profitable meeting, I am truly yours,

D. W. HUMPHREY.

On motion of Mr. Grimes the secretary was requested to write to Mr. Humphrey, expressing the sympathy of the society.

TREASURER'S REPORT.

Report of the Treasurer of the State Horticultural Society, for
the current year ending Jan. 16, 1883:

To the President and Secretary of the Minnesota State Horticultural Society:

The following account of the receipts and disbursements for the
current year is respectfully submitted.

J. T. GRIMES,
Treasurer.

RECEIPTS.

1882.		
Jan. 19,	From M. L. Tibbets, ex-treasurer.....	\$45 00
19,	From Sec. Hollister, membership fees	40 00
19,	Order for balance State appropriation, 1881.....	641 39
July 12,	From O. Gibbs, acting Secretary, six memberships.....	6 00
15,	One-half State appropriation 1882....	500 00
Dec. 13,	From O. Gibbs, Secretary, nine membership fees.....	9 00
30,	From Fred Busch, one membership for 1883.....	1 00
1883.		
Jan. 1,	Interest on \$200, reserve fund for nine months.....	9 00
1,	Interest on \$200, reserve fund for four months.....	4 00
Total receipts.....		\$1,255 39

DISBURSEMENTS.

1882.		
Jan. 19,	Premiums paid at winter meeting on vegetables.....	\$20 00
19,	On flowers.....	32 00
19,	On canned fruits.....	11 00
19,	On fruits.....	40 00
19,	Johnson, Smith & Harrison, heating hall.....	6 00
19,	Gas fixtures and labor	4 50
19,	Gas bill	2 10
19,	Plates for fruit exhibit.....	1 50
Feb. 2,	R. J. Mendenhall, (reimbursed) from membership fees.....	100 00

STATE HORTICULTURAL SOCIETY.

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Mar.	8,	D. W. Humphrey, executive expenses.....	8 25
	8,	Oliver Gibbs, Jr., delegate to Wisconsin Horticultural Society.....	20 00
Apr.	18,	U. S. Hollister, first quarter salary 1882.....	50 00
	18,	U. S. Hollister, 500 letter heads.....	4 00
June	14,	Oliver Gibbs, Jr., incidental expenses (to be accounted)....	25 00
	14,	Chas. E. Young, printing per bill.....	11 50
	14,	Oliver Gibbs, acting secretary second quarter salary.....	50 00

PREMIUMS PAID AT SUMMER MEETING.

June	14,	On green house plants and flowers.....	34 00
	14,	On small fruits.....	42 00
	14,	On vegetables.....	10 50
	14,	To Wyman Elliot, money advanced to ex. com.....	27 85
	28,	J. S. Harris, traveling expenses summer meeting.....	7 00
Sept.	6,	Wyman Elliott, executive expenses to Rochester.....	6 85
	6,	D. W. Humphery, expenses to Rochester.....	4 00
	6,	Oliver Gibbs, Secretary, expenses to Rochester.....	4 60
	6,	Oliver Gibbs, incidentals to be accounted for at winter meeting.....	25 00
Dec.	13,	Oliver Gibbs, Secretary, third and fourth quarter salary for 1882-3.....	100 00
	30,	Treasurers's incidental expenses 1882.....	3 90
	1883.		
Jan.	15,	Expenses to St. Paul.....	1 00

Permanent fund on hand.....	\$400 00	
Interest.....	18 00	
Balance in treasury.....	189 24	
		<hr/>
		\$1,255 39

The finance committee have examined the treasurer's report and find it to compare with his vouchers and book, and is correct.

J. M. UNDERWOOD,
WYMAN ELLIOT,
Committee.

PROCEEDINGS, ESSAYS AND DISCUSSIONS.

Treasurer Grimes: In explanation of the third item in the foregoing statement of receipts, I will say that the amount of \$358.61 of the State appropriation for 1881 had been drawn by preceding officers. The annual reserve fund of \$200 was to have been invested in bonds, but as I could find no bond of that denomination I placed the money in the savings bank at 6 per cent. interest, under instructions of the executive committee.

Prof. Porter moved that the treasurer be allowed a salary of twenty-five dollars, and the motion prevailed.

The secretary stated that the presence of the treasurer was always required at the meetings of the executive committee, and moved that he be authorized to act with the committee, *ex officio*, together with the president and secretary, and that his expenses at the Rochester meeting in September last, \$6.85, be refunded.

Motion adopted.

The President announced Mr. Pepper's paper on "Apple Blossoms."

The Secretary. At the request of several members I will say a word as introductory to this paper. Mr. Pepper is known among pomologists as a scientific breeder of new varieties of fruits, and hence a faithful observer of all things which indicate the laws of tree and plant growth, especially those that govern reproduction, crossing and hybridization. The paper which he will now read lays the foundation for some practical advice he will give us further on in this session in his prize essay showing us how to improve our fruits by production of seedlings, and as we are about to enter systematically upon that means of obtaining "a pomology of our

own," I bespeak for this paper, dry as some of its details may seem, a patient hearing.

The paper was then read as follows by the author :

FURTHER STUDIES IN APPLE BLOSSOMS.

BY GEORGE P. PEPPER, PEWAUKEE, WIS.

Mr. President and Gentlemen:

It is a pleasing incident for a busy man to be called away once in a while from his usual avocations to meet his co-laborers who have the same objects before them, and also those who are to take up the work where we must soon leave it, and carry on the grand material progress of raising our own fruit and trees that will be adapted to our changeable climate. It is more especially pleasant for me to have been asked to address you, or to read a paper on this subject, as I expected to have been here a year ago and to have had a talk with you, but was prevented. Although you had my paper it was not satisfactory, because the extraordinary season of 1881 was unfavorable to the observations of apple blossoms; but now I can give you more reliable notes on last year's bloom on different varieties, and I hope there will be, at least, some here who will take up these investigations and study the points hinted at, so as to assist nature; and I have no doubt in my mind that before many years elapse we will enjoy as good and long-keeping varieties of fruits as our neighbors do in the natural fruit belts, and grow them with as much success.

In order to breed new and improved varieties of fruits systematically, and with any hope of certain results, we must search out and make familiar to our minds the laws of nature that govern the process. Blossoms are at the foundation of apple breeding. Were it not for this we should have not attempted at this time their further study.

Your division of the subject, as given me two years ago, embraces five points in apple blossoms:

- 1st. Their date of opening.
- 2d. What varieties mature their blossoms simultaneously?
- 3d. What varieties are perfect and what imperfect for self pollinizing?

4th. What varieties should be planted together for mutual perfection in pollenizing?

5th. What varieties have the greatest power to resist spring frost and winds.

Although I answered these questions in my previous paper, read at your meeting last year, the answers were not satisfactory to myself, on account of the late spring and the heavy snowdrifts that lay in parts of my orchard. The same varieties did not have an equal chance for development. I kept close watch this spring of the weather and date. I shall have to make extracts, therefore, from my diary: "Our warm spring weather began to-day, May 6, 1882. Mercury went up at 2 P. M. to 84° in the shade; ground quite dry; buds on early stone fruit developing fast. May 7, very warm, 86°. May 8, warm, 82°; showery this afternoon; saw the first blossoms on early plums and peaches. Rain this morning, May 9. May 10, 84° at 2 P. M.; early peaches and plums in full bloom. May 11, rain; cooled down to 52 degrees. May 12, rain yet; cooled down to 42 degrees. May 13, cloudy; 46 degrees; sun began to shine at 5 o'clock P. M. May 14, a fine day; 50 degrees at noon; early cherries and plums in full bloom. May 15, wind north; heavy frost this morning, but mercury went up to 52 degrees at 2 P. M.; some plum blossoms frosted on low ground; cherries all right. May 16, 46 degrees at 2 P. M.; saw the first apple blossoms on Summer Rose and the first pear blossoms on Early Napoleon. May 17, a slight frost again; wind shifted to southeast, and at 2 P. M. 80 degrees in the shade; Early Richmond and Kentish cherries, also early pears, and here and there an apple blossom are showing themselves; it is growing warmer all the time. May 18; this morning at 7 o'clock it is 58 degrees; blossoms are showing themselves most everywhere. It is 84 degrees at 2 P. M., and everything is taking a start again. Then came a few cold days and nights that put a damper on blossoms; but they have got a good ready now. There are a few flowers on Transendent crab and Early Red, also on Belleflower crab and Early Harvest, Sweet Harvest, Wealthy, Utter, Jonathan, Winter Wine, Whitney No. 20, Fall Stripe, Fall Orange, etc. Duchess of Oldenburg, Early Strawberry, Haas, Fourth of July, Lyman's Yellow and Early Red commencing to bloom freely.

May 19—Cloudy this morning; very warm all night; 72 degrees at 2 P. M.; rain at 5 P. M.; cool this evening. Most all varieties of the apple and Siberian crabs and hybrids commenced blooming. This warm wind fetches them all out at once except Northern Spy,

Rawle's Janet, Calvert and Rambo. Pears all in full flower. Pewaukee and Clark's Orange are in bloom. May 20, quite cool this morning, but clear sky; 45 degrees at 7 A. M.; 76 degrees at 2 P. M. Standing by the south window up stairs in my workshop and looking over the tops of nearly half my orchard, it reminds me of the spring and season of 1980, as every tree appears to be covered with bloom—apples, pears, cherries and plums, and a few late peaches. The early ones have already dropped their petals; all of them promise a full crop of fruit.

That seedling pear from Flemish Beauty, 1871, is full of bloom, mostly double flowers ten to twelve petals and two inches in diameter, pollen a dark purple; if the pears will be as showy as the bloom, it will be large and fine.*

May 21. Examined many varieties of blossoms to day; all seem to be perfect in male and female organs in same flower, but there is as much difference in the shape of the petals, in their size, color, form and general appearance as there is in the fruit itself. Some have cup-shaped petals, with erect, strong pistils, as for instance the Wealthy and Fameuse, and the pistils protrude through the cups somewhat before the pollen in same blossoms is perfected, and these pistils will take the pollen that flies early from neighboring trees that have blossoms with straight petals and their pollen all exposed to sun and wind. The cup-shaped ones will therefore be surer to bear a crop of fruit than the straight petaled ones, which lose their pollen.† The wind and insects will sometimes carry the pollen long distances from the straight petaled trees, and distribute it so abundantly, that not a single flower on the cup-shaped ones will be fertilized by its own pollen. But the wind does not blow every day, and insects cannot always be depended upon, so the buds do not all open at the same time, and later flowers in periods of calm or in absence of insects may be fertilized by pollen from the same bud, if not from the same flower; but most varieties have only one or two perfect apples from the same bud, and hence it is very doubtful if we save the seeds of such apples and plant them

* Nov. 20. Just made an outline drawing of this pear. Form and size same as parent; color—the upper half russet, the lower or stem half clear, yellow and smooth skin; imperfect for eating now, but will be a good dessert pear when fully ripe, although not as sweet as the Flemish Beauty. For culinary purposes it will be better for being more tart, and the flesh being firmer. It will rank as one of the best American pears for all purposes.

† NOTE BY THE SECRETARY.—Observers are requested to note next spring and report what varieties are straight petaled and whether they blossom freely and bear scantily. Look at Quaker Beauty and Orange Crabs and see if they correspond with this theory. Then *vice versa* look at the cup shaped ones, like Wealthy and Duchess. Also see if any straight petaled ones bear well and if so, whether they have a chance to get pollen from other trees.

whether we can get fruit that will compare with that of the seed bearing parent tree.

Mercury at 80° at 2 p. m., and all varieties of the apple and crab had more or less bloom, except Rawle's Janet and Northern Spy. Of Calvert, out of thirteen trees only one showed bloom. The Russians are all in full bloom and promise a large crop of fruit.

May 22, quite cool and clear; 52 degrees at 7 a. m., 67 degrees at 2 p. m. May 23, cold; 38 degrees at 7 a. m., but no frost anywhere. Calvert's are all in bloom now, but Northern Spy, Rawle's Janet and Rambo are yet asleep or under cover. May 24, warmer; 62 degrees at 7 a. m., 82 degrees at 2 p. m.; petals are dropping from many early blossoms; they are not wilting as they did last year, but seem now to be all right. May 25, 54 degrees at 7 this morning; 78 degrees at 2 p. m.; commenced to rain at 5 p. m.; is very cloudy, wind northwest. May 26, 46 degrees at 7 a. m.; 65 degrees at 2 p. m.; clear; worked all day with coat on; Rambo and Talman Sweet trees in a grove of evergreens just beginning to bloom; Janet and Spy, ditto. May 27, 42 degrees at 7 a. m.; 62 degrees at 2 p. m.; early cherries are like No. 1 shot in size; pears are setting finely, but early plums are dropping off. It is cold enough to keep a coat on all day, planting corn. May 28, 46 degrees at 7 a. m.; wind northeast; 76 degrees at 2 p. m.; the blooms have staid on well; no sign for blight as long as we have it so cool. May 29, 62 degrees at 7 a. m.; 80 degrees at 2 p. m.; all well thus far; fruit has set well; a very good prospect for a crop."

To summarize, and answer your questions, and compare with last years' observations, we cannot come to any definite conclusion, because the seasons were so different. However, as the spring of 1882 was more uniform with our average seasons, we will draw from this as follows:

1st. *Time of Opening.* May 16; saw the first apple blossoms on Summer Rose, and pear blossoms on Early Napoleon. May 17; quite a number of varieties of the apple trees are having a few blossoms, but mostly on the lower limbs. May 18; this day being a very warm one, all fruit trees seemed to hurry up with their blossoms, and among the most forward ones were the Duchess of Oldenburg, Early Strawberry, Fourth of July, Haas, Lyman's Early Red, Lyman's Yellow, Tetofsky, Favorite, Cranberry, Pippin and others. May 19; nearly all varieties of the apple and all of the pears commenced blooming except the late ones mentioned, which, owing to the cool days after the others came into bloom, lingered along until the 26th of the month.

The first apple bloom we saw in the previous year, 1881, was on the 4th of June, and then the Talman Sweet was one of the first ones to come out. This year, 1882, the Talman was one of the last ones to bloom. Hence we conclude that location, sunshine and warmth have more to do with early blossoming than varieties themselves. The only varieties that we thought could not mix much in pollen were Rawle's Janet and Northern Spy.

2. *What varieties mature their blossoms simultaneously?* Most all the varieties commenced and matured about the same time (except the few late ones mentioned), as the weather was uniformly cool.

3. *Perfect and imperfect in self-pollenizing.* The varieties examined were all well developed in both pistils and stamens, apples as well as crabs, pears and all other blossoms. The winter and spring weather was all very favorable for this.

4. *Varieties to be planted together for mutual pollenizing.* We cannot answer this better than in last year's paper. Plant contiguously those varieties that blossom at the same time. We find that all our fruit, of either apples, pears, plums, or cherries, were fully impregnated or fertilized, as they are full of perfect seeds. On close examination of the seeds it is found that there are but few alike. They vary in color (even seeds from the same fruit) and in shape and size as much so as you find on ears of corn where it is exposed to be pollenized by another variety.

4. *Resisting power of blossoms to wind and frost.* The latest blooming, and blossoms with short pistils and hollow or cup-shaped petals, which lock in and shield the embryo seed and pollen, are the ones that resist the wind and frost the best.

We had not discovered the difference in seeds before, and would not have known there is so much of interest connected with the study of fruit blossoms; but seeing such a difference in petals in shapes and colors set us to examining and comparing the seeds of the fruit of the same tree. Although the fruit does not seem to be affected by the cross pollenizing, the seeds are greatly influenced, as anybody can see by close observation. For instance, there is a variety that has a light-brown or yellow-colored seed, and the pollen fertilizes a variety that has a black seed, and here, in the new seed, you will find the color of the male or pollenizing parent mixed in the same as you do in corn. Then, again, where one variety is a round or short oval shape and the other a slender and very oblong one, you can trace the influence of the pollen in giving the shape of the new seed; and I shall not be much disappointed if some

one gets up, here or hereafter, and tells us they can pick out the seeds that are pollenized by such and such a variety. If that can be done there will be another step in advance in raising trees from seed to better satisfaction than we have known before.

In support of his statement that isolation of blossoms will enable a tree to reproduce its fruit in kind, Mr. Pepper said, The wild crab never mixes with any other apple, because, although the petals are cup-shaped, they fold inwards closely and the pistils are not exposed to pollenizing from other varieties that may bloom near them.

A member asked if the wild crab was not later in blossoming than any of the other members of the *Pyrus* family.

Mr. Pepper says not.

Colonel Stevens wanted to know if the Soulard was a wild crab.

Mr. Pepper. It is.

The Secretary. With us the Soulard is rather late in blossoming. I noticed it last spring the same time as Talman Sweet, and thought then that if we could sweeten Soulard with Talman by cross-breeding, and get Soulard hardness into the seedling tree, we might have a good thing. Will somebody try it by hand pollenizing next spring, and save the seeds in the fall for planting, on Mr. Pepper's plan in his forthcoming prize essay? This hand pollenizing is as easy as to plant a flower seed or to tie up a rosegay, and should be taught to children as a recreation and a pleasant study in flowers and fruits. School classes in botany would find it an improving exercise.

On motion of Col. Stevens a vote of thanks was extended to Mr. Pepper for his valuable paper.

Mr. Underwood inquired why it is that some blossoms are less injured by frost than others.

Mr. Pepper. They have more wool on them.

Mr. Underwood. Why will Wealthy blossoms kill by frost in some places worse than in others?

Mr. Pepper. It may be owing to location. Elevations and depressions of ground largely affect temperature and the circulation of the air.

Mr. Underwood. Last spring we had abundant blossoms of all varieties in our orchards. The Duchess, and most of the other varieties were either all killed or injured, while a Wealthy orchard adjoining the Duchess, escaped and bore a good crop of apples. Yet in this orchard where location, elevation, culture, age, and all

apparent conditions were the same, some Wealthy trees had their blossoms killed and others did not. I hope some solution of this can be given.

Mr. Peffer. Perhaps they did not all blossom at once, or were not at the same time in the stage of blossoming most open to injury by the frost. There might be this difference in blossoms on the same tree, because they are like potato sprouts, and come at different times. Watch close and you will see.

Mr. Underwood. I have never held a watch on my apple trees.

Mr. Peffer. Well, you have got to.

Mr. Whipple. In a level orchard of Transcendents exposed alike to frost the center trees bore no fruit, while the outside rows had a full crop.

The Secretary. Prof. Porter explained that very clearly, at the summer meeting. Freer circulation of air is all there is of it.

Ex. Lieut. Gov. Norman J. Colman being discovered among the audience was introduced by President Sias and invited to address the society. Gov. Colman said :

GOV. COLMAN'S ADDRESS.

Mr. President and brother Horticulturists:

I am invited to speak on short notice, and have not much to deliver. In fact I do not know why I am called on. However, I have been engaged in fruit growing considerably, and feel at home in such meetings as this, and if I could say a word here to influence anybody here I would wish to exhort all who own a piece of land, however small, to grow fruits, especially small fruits, which you raise in great perfection in Minnesota. Especially would I exhort the farmers to do so, and raise an abundance for their families. As I ride through the country in Missouri, and even here in Minnesota, it makes me feel bad to see how these cheap, but healthful and delicious luxuries are neglected. Every farmer might have his strawberries, his raspberries, his grapes and his currants, as easily as his cabbages and his potatoes. Even for the economy of health and the saving of doctor's bills, to say nothing of the cheerfulness and comfort of a home so cared for, I would urge farmers to grow the small fruits. Their acids separate the

bile and ward off the billious fevers of western climates and their attendant ills. Grow flowers also. They cost but little money, and are elevating, purifying, harmonizing in their influence upon the character of yourself, your wife and your children. The boy who is brought up among flowers and given a chance to love them will never come to the gallows. In my walks from my home to my office in St. Louis, I sometimes pass through or by a group of rude urchins engaged in quarreling or in vulgar, profane and boisterous conduct on the streets. If I have my basket of flowers with me, the instant their eyes catch sight of them, every sign of rudeness is quelled, their faces light up with joy, their eyes sparkle, and "Give me some, give me some," I hear from all sides, and for the moment they are transformed by the gratification of that innate sense of beauty which dwells in the lowliest, roughest mind. The farmer who does not cultivate flowers or encourage it, does not do his whole duty to his family. Grow more vegetables also. Do not leave the kitchen garden so dependent upon the wife. She has more than her share of the burden on the farm. Plant your garden so that when your corn is being tended you can give the rows of vegetables and small fruits a turn with the cultivator at the same time; and see to it that when you gather your farm crops into barns and bins, the wife has her supply in the house and cellar from the vegetable garden to set out her table with the daily meals that please yourself, your family and the occasional guest. Fellow horticulturists, I am glad to have met you here, and glad to have the privilege to make even this short plea for horticulture.

Credentials were presented by A. J. Phillips, of West Salem, and George P. Pepper, of Pewaukee, as delegates from the Wisconsin State Horticultural Society.

The president appointed Messrs. Fuller, Underwood and McHenry, as a committee to report upon the recommendations of the address of President Harris and the report of the secretary, and on motion the treasurer's report and the financial statement in the secretary's report were referred to the finance committee, Messrs. Underwood, Kinney and Elliot.

President Sias then read his paper on "Black Heart in Fruit Trees."

BLACK HEART IN FRUIT TREES.

BY A. W. SIAS, OF ROCHESTER, MINN.

"Black Heart in Fruit Trees." This dark and dismal subject naturally belongs to the scientist, of whose hidden mysteries I have as yet been able to obtain but a mere glimpse. And my excuse for calling your attention to it at this time may be found in a letter received from our secretary, wherein he states, "Mr. Harris says you are loaded for bear on 'Black Heart.'" Now Mr. Harris very well knows, from my weak attempt to bolster up that "Black Hearted" institution known as the Wealthy apple tree, at our last winter meeting, that my fowling piece was of too small a calibre for even the bacteria, to say nothing of that great black bear, alias "Black Heart," that has been the terror of so many thousands, and deprived nine-tenths of the good people of Minnesota of one of the greatest blessings that God ever bestowed on a family, viz., a good orchard. You teach a man that there is no essential difference between animal and vegetable physiology and that a bearing fruit tree should be alive and active from center to circumference, or otherwise worthless; I say you teach a man this false doctrine and make him believe it, and then show him the best so-called iron clad hybrid in the State, say ten or fifteen years old; show him the heart wood and he would tell you that all such trash was wholly worthless, and so would I if I believed as he does. Will the fruit tree that maintains the largest amount of sap wood necessarily be the longest lived, and most profitable? I think not. For instance, the Baldwin is said to be one of the most, if not *the* most profitable variety in New England. It is a long-lived tree, although it has not usually been accounted extremely hardy. And so of the Wealthy and other varieties that fail to maintain quite as much sap wood as the Transcendent, yet may endure as long and prove far more profitable. "A tree is known by its fruit." The same is true of men; we judge them by their fruits, of what they have been able to produce or accomplish, and not by their physical development. After a dry summer and severe winter, our hardiest trees contain but a small amount of sap wood. The same is as true of the mammoth tree of California (*Sequoia Gigantea*) as it is of our hardy fruit

trees in Minnesota. And yet the Sequoia described by Bayard Taylor was said to be 3,100 years old, ninety feet in circumference, contained 250,000 feet of timber, required six weeks of steady labor to bring it back to its mother earth, and cost the sum of \$550.

Now, if a common sunflower, a little over three feet high, has been found to exhale, as Prof. Gray says, about one quart of water in a day, how much ought a full grown apple tree to throw off, allowing each leaf to contain 100,000 breathing pores, or, to make the contrast still greater, suppose the mammoth tree described by Bayard Taylor was composed wholly of sap wood, throughout its entire woody cell structure, and throughout the whole growing season, at least, these cells had been kept full and active for the 3,100 years that it had been standing, is it not just *barely possible* that the water supply would have given out before that time? And how such a preposterous system would upset all preconceived notions of vegetable economy, economy of nature, etc! Now, if it is possible for these giants of the forest, composed as they are mostly of dead vegetable matter, to maintain a standing for two or three thousand years, is it not reasonable to suppose that some of our hardiest fruit trees, with good culture, and in spite of their "black hearts," may continue to yield their fruits for at least 100 years. They belong to the same class of exogens, are made and operated in about the same manner.

The croaker makes no distinction between Heart wood and "Black Heart," with him it is all "Black Heart." There is a deposition of vegetable coloring matter in the heart wood of every known species, peculiar to itself, and frequently quite a marked difference in the different varieties of the same species. Now if we could only find a variety of the *Pyrus malus*, with heart wood precisely the same color of its sap wood, or as nearly so as in the case of the Ash leaved Maple, (a specimen sample of the wood of which I have here,) it would prove a "God-send" to the man of little faith, and also to the *honest*, though despised tree pedler. The war between those who contend that fruit can be grown successfully in Minnesota, and those who still proclaim loudly that it cannot, is mainly between those who have some little insight into the "Theory and practice of Horticulture," and those who have comparatively none. There should be a better understanding between what we call practical and scientific men. And there might be, if the so called practical men would come out and hear the lectures before the Agricultural department of the University. During nearly a quarter of a century that I have been living in

Minnesota, I take pleasure in stating, that I have never received a word that was intended to discourage me in my efforts to grow fruit, from a man posted on Vegetable Physiology, and the fact of this society being invited to hold their winter meetings at this University shows which side the faculty are on.

The scientific man is far more modest and unassuming, and less aggressive than the merely practical man (so called). His diameter of light is greater, and of course his circumference of darkness is correspondingly great. He sees more of the "Black Heart," more of the other dark things of earth, and more things that are beyond the power of the human mind to fathom, and doubtless this is why he is less aggressive. Here is an extract from a letter received from a man well up in the "Theory and Practice of Horticulture," and who has lately been taking "object lessons" in high latitudes. He says: "It would be the height of folly to cut out all trees suspected of being "black hearted." Even in Southern Iowa a large portion of the trees will be found to maintain life only in the wood of most recent formation. After excessively dry seasons, irrespective of low temperature, the dark colored wood approaches nearer the surface, than after two or three moderately wet seasons." Some six or eight years ago, I grafted three Hislop trees with scions of the Pewaukee. They flourished finely the first summer, but the following spring found them dead just about half way down to the stock on which they were grafted. Of course I pronounced it a failure with me, but I am happy to say that it paid no attention to my premature decision, (from the appearance of the "Black Heart.") I was not "loaded for bear" at that time! But it kept right on improving from year to year, until last year when they were all well loaded with beautiful fruit! (And I have some of the fruit here to show for it!) And for one I am thankful that Geo. P. Peffer (the originator), one of our honored life members, still lives, and I hope he may be found among the "Apple Blossoms" for many years to come.

There is no general circulation in the woody cell structure of our fruit trees, like that in common animals, as many suppose. If there was, then of course, I would acknowledge the fact at once, without argument, that "Black Hearted trees" were worthless. But what does Prof. Gray say on this point? "The heart-wood being no longer a living part, may decay, and often does so, without the least injury to the tree, except by impairing the strength of the trunk, and so rendering it more liable to be overthrown."

In closing, I have but a single ray of comfort for that respectable

class, always in the majority in Minnesota, who cannot be humbugged into planting trees with hearts so frail, and life so transitory. All sensible people admit that land owners should plant trees of some description. And I would most respectfully refer the above named class of careful, prudent men, to the tender consideration of the artistic works of a "Tree Dealer" who has set up in the grounds of the State House of one of the Carolinas, a Palmetto tree, made of iron. Employ him to set up your fruit trees! They will doubtless cost you a trifle more, but you will have the everlasting satisfaction of *knowing* that they are *strictly Iron Clad*.

A. W. SIAS.

Mr. Elliot moved that a committee be appointed to confer with the Amber Cane Association in reference to a joint convention.

Carried, and Messrs. Elliot, Brimhall and Fuller so appointed.

J. T. Grimes read the following :

REPORT OF COMMITTEE ON EVERGREENS.

Your Committee on Evergreens cannot urge too forcibly the necessity of their use in adorning our home grounds and making them attractive and pleasant and in protecting our buildings and orchards from the cold sweeping winds of winter and in beautifying our lawns and cemeteries, and surrounding, as it were, with immortal green, the homes of both the living and the dead.

While the deciduous tree casts off her garments at the approach of winter and stretches out her naked arms in helpless solitude and the flowers have been buried beneath the snows of the valley, each seeming to say, Nature now is dead; her obsequies are past and we are known no more: the evergreen, with matchless grace, points high to Heaven, and seems to say, these robes of mine are borrowed from yonder clime, where flowers ever bloom and trees immortal grow. It is said there is a language in the trees, but we shall know little about it unless we commune with them and hear them conversing together. But I am not called upon for an essay but a report—a report upon evergreens.

Well, what have we here? An arboretum! Just such a one as we suppose might be growing in the experimental grounds of the State University. I see the Professor has grouped them all in

families, but some of them claim to be only third or fourth cousins removed. And then, to avoid all mistakes, they are labeled to name; and such names. Whether his learning or our ignorance is at fault is pretty hard to tell. One thing is certain, we know the difference between a pine and a holly.

We will first introduce ourselves to the pine family; they seem to be of all sizes, and we should infer of all ages, but the Professor says "they are all of about the same age. The difference is in their constitutional vigor of growth. Those found on top of the 'rockies' never make anything but dwarfs, but these dwarf pines are perfectly hardy, branching at the ground, grow into a perfect globular form with little pruning, and are quite ornamental in well kept grounds." But here is a specimen that comes nearer to our idea of a tree. It is labeled *pinus strobus*, but we should call it a white pine. It is perfectly at home everywhere, being native born, and seems to be quite a dandy among the pines, of straight, upright growth, light-green feathery leaves, and long, pliant branches, and is worthy of a place in every collection.

Well, here is a foreigner, but he has taken out naturalization papers, and seems to be as much at home as his neighbor. He is called here *pinus sylvestris*. The Professor claims there are several hardy varieties of the Scotch pine, but this is about the only one found in our nurseries. Here is another specimen labeled, *pinus Austriaca*, quite distinct from the others, a type of a perfect color in evergreen foliage. By this we mean to convey the impression that any one shade of color, however pleasing, is not desirable for all trees; hence the white pine with its light-green foliage, the Scotch tinged with blue, and the Austrian with its clear, pure depth of green, form a marked contrast in color at once pleasing to the eye that Nature charms. But the Professor says, "There are some objections to the Austrian on account of its rough growth while young, in not adapting itself to every kind of soil, and in not being hardy in all exposures. While the white and Scotch pine thrive best in soils composed of sand, and defy the cold winds that come out of the North, the Austrian is equal if not superior in richer and more compact soils and less exposed situations."

There are other varieties of the pine family here, but as they have not been sufficiently tested we forbear to pass upon them.

We will now make the acquaintance of the spruce family, and, as we pass along, we venture to remark that we never saw trees so perfectly symmetrical in their form of growth. The Professor just lets the fact leak out in his remarks, "that science sometimes as-

sists nature in her operations, and whenever truant branches (as he is pleased to call them) reach out too far away from the parent stock a little clipping in with the shears is very effectual to promote harmony of growth, and which, if done before the scion strays too far, is soon covered up with a dense foliage, so that a practical eye could hardly detect nature's wandering attempt."

Here is the *Abies Excelsa*. Although a native of Norway it has become universally popular on account of its many good qualities; so healthy, hardy, thrifty and graceful when young and adapts itself to so great a variety of soil and climates that no native tree on our own continent is so universally planted for embellishment.

The next in value as a hardy ornamental tree is the *abies nigra* or black spruce. We must not confound this with the *alba* or white spruce, it being a far better and more desirable tree, equal in many respects and in some superior to the Norway spruce. Both trees have proved to be superb representatives of their class. The Professor says, "the *abies alba* has not given satisfaction in these grounds, its growth and foliage is too thin and meagre." There are several others of the spruce family that deserve attention, but our time is too limited to notice them all. But here is one that seems to be an oddity in its way, almost calculated to provoke our risibility. Fancy might imagine it to be the old man of the forest, clothed in a monk's gown. It is labeled *Abies excelsa inverta*. The Professor describes it to be "a sport of the Norway spruce." The branches turn so naturally toward the earth that it is absolutely necessary to tie the leader to a stake to gain the height necessary to exhibit the charming oddity of its growth.

When it is thus trained the side branches fall directly downwards, and with their rich covering of foliage drape the stem as a robe falls around the person. This and Wales' new drooping Norway spruce and the *Picea pectinata pendula*, their counterpart in another family, are the three most charming novelties among the hardy evergreens suited to the decoration of small places.

Our attention is now directed to the beautiful *Piceas*, the most common of which is the Balsam fir. It is a native of our Northern States, and the Professor says, "the most popular and least valuable of the whole tribe. As seen in the nursery it has a pleasing effect, and it is not singular that its infantile beauties have made it the universal favorite with all novices in planting; but it is like one of those pretty little girls who surprise us in a few years by her sudden transition to homely old maidenhood." The Professor no doubt would have trees and girls grow old gracefully.

We will now look up the beauties. Most of the silver firs (not the girls), are too tender to be of much value here. This fact the Professor has learned to the cost of the State. But here is one, *Picea Pichta*, a native of the mountains of Siberia. It is one of the most valuable firs recently introduced, on account of its medium size and dense foliage. The shade of color is a peculiar deep rich green, and like watered silk, is changeable when viewed in the light of the sun.

Here are some trees that are not classed, but appear to be only specimens on trial. For instance the *Sequoia gigantea*—whatever that may mean—it is evident that it can amount to nothing here. Whenever the Professor finds anything valuable that he can freeze on to, no doubt he will be ready to report.

Well, here is a very peculiar looking evergreen, the *Larix Europaea*. It is said to be one of the most durable and valuable, as well as one of the most rapid growing trees. But the Professor says "it is only a sub-evergreen, and cannot be admitted to the regular class until certain conditions are made up." How much embarrassment we are frequently compelled to undergo on account of our ignorance?

But here we have a different class of evergreens, that bear the shears so well that they may be made to assume the most beautiful forms of growth. Whether intended for hedge screens or single specimens for ornamental planting, there is nothing to take their place. They seem designed in the economy of nature to beautify the landscape about our dwellings and small home grounds where large trees would not be admissable. The very first in this class to attract our notice, is an old acquaintance of our school boy days, the white cedar or *Arborvitae*. It is found growing abundantly in in many places in all the Eastern and Northern States. In these grounds it is called *Thuja Occidentalis*. The Professor says "a number of sports or offshoots differing materially in form, growth, foliage and color, have been propagated from this single variety. Those of a golden shade of color are not considered to be quite as hardy as the parent, while those of a deeper green are probably more hardy." Of the former *Parson's compacta* and *Hovey's* are probably the best varieties for this climate, but even those should not be planted in bleak exposures. Of the dark green colored, *Nees plicata* and the *Siberica* are perfectly hardy, but the Professor is not quite sure of the origin or relationship of the latter; but whether native or foreign, it unites more good qualities for common use than any other we know of.

Here is another of our native evergreens, the *Juniperus Virginiana* or red cedar. I believe it is found in every State of the Union and is perfectly hardy in the North, but proves tender when transplanted here from nurseries very far South. It lacks very little of being one of the most beautiful evergreens, and bears the shears so well that it may be made to assume the most pleasing diversity of forms.

Well, what nice little trees are those that form this little group by themselves? *Biota*, *Retinispora* and *Juniperus hibernica*; ha! ha! now we think we have got the professor, all perfectly tender! "Emphatically," says the professor with a very broad smile, "you see they are planted in boxes and we shall remove them to the conservatory at the approach of cold weather. They are intended for the University campus ornamentum, when the grounds are ready to receive them."

We think our time limited and thanking the professor for his kind and courteous attention, take our leave, and when again we visit the *Arboretum* we shall expect to find our names enrolled among the list of evergreens.

Respectfully submitted,

J. T. GRIMES.

QUESTION BOX.

When common apple is grafted on crab stock, will the fruit be as large as when same variety is grown on apple stock?

Mr. Pepper. I think it will if top-worked; if root grafted, not.

President Sias. I think it will not. The process dwarfs both kinds, and if the wood cells are dwarfed, why not the fruit also? Winter Oporto and Hyslop is always one-third smaller than on common apple stock. I have worked much on crab stock; and others who have worked apple on apple stock, have always beaten me.

Gov. Colman says this is not the rule with pears. The fruit of dwarf trees is largest.

Mr. Brimhall. I have obtained the finest specimens of the apple by top-working on the crab. Wealthy on crab stock will give as

large fruit as standard trees. Think if properly cultivated it will make no difference.

Gov. Colman. You can often check growth and induce bearing by wiring or ringing the trunk or limbs. Fine fruit is thus obtained.

Mr. Pepper. It looks better but is not as good, and Wealthy girdled will ripen three weeks sooner. It takes better color, but lacks flavor. We have always found large fruit poor in quality.

Gov. Colman. We grow apples in Missouri mostly to sell, and care less for quality.

Mr. Phillips. I have read of Illinois men girdling trees, and they had to throw them on to the brush pile. It may do in warm climates, but in Northern Wisconsin and Minnesota it may sometimes prove a dangerous experiment.

The society then adjourned to meet at the room of the Hermean Society in evening session.

EVENING SESSION.

The program was opened by the reading of Mr. Kellogg's paper on "Strawberries," by Assistant Secretary Stearns. The paper is as follows:

STRAWBERRY EXPERIENCE.

BY GEO. J. KELLOGG, JANESVILLE, WIS.

Mr. President, Ladies and Gentlemen:

My first experience among strawberries was in the meadows about Fulton, N. Y., which did not vary much from that of Wisconsin, which began at Kenosha, 1835, about a tea cup full for a half days' hunt, about the size of peas; but was'nt they good; what better now?

The thousand miles traveled and three years spent in California does not recall a single wild strawberry among its mountain mines. Only one feast of wild grapes on the Sacramento and one of choke cherries on the western slope of the coast range, were all the wild fruits (except the Grizzly Bear berry of the chaparral, and the seed of the Mountain Pine) that I saw in that land of gold, which now excels in choice fruits. After three years of hard tack and scurvy, no wonder I took the strawberry fever on my return to Kenosha, in 1852, since which time I have raised strawberries all the way from the size of a pea to larger than pumpkins in June, and all the way from nothing to more than double the ordinary yield of potatoes to the acre.

The most profitable varieties before the advent of the Wilson were Early Scarlet and Hovey's Seedling. The Wilson has produced four and a half bushels and five bushels per square rod by different cultivators, at the rate of 800 bushels per acre. And now a prominent eastern firm says a western man says the "Lacon" strawberry produced from six to fifty times as much as the Wilson growing alongside of it; berries four and a half to five and a half inches, six days earlier than Wilson and later than Kentucky; 213 berries to a single plant, as firm as Wilson, bright red flesh perfectly hardy; and all this on matted rows without cultivation."

If you can't believe all that, just take a dose of "Old Ironclad," the first plant valued at \$5,000.00. This flourishes when drouth kills everything else; fruit size of Sharpless; ships 300 miles; five days earlier than Wilson; more juicy than Jucunda; the only objection given, it is too large.

Both these varieties are perfect in the blossom and will do to set beside the "Manchester," which is the most desirable of 250 kinds raised by a prominent eastern grower; 220 berries on a single plant; flourishes alike in sand or clay; uniformly large to the last; exquisitely beautiful; a charming scarlet with golden seeds; superb quality; sweeter and richer than any other productive variety; bears twice as much as Wilson, and endures drouth better than any other kind.

Try, also, "James Vick" with its "280 berries to a single average plant; good size, form, color, vigorous, productive, healthy, first quality, producing a wall of berries hardly admitting a bug; blossom perfect; will remain on the vine a week after becoming ripe without getting soft or losing quality."

Then comes "Big Bob," so large you can get but two on a page (I mean pictures) I could not get over six in a quart cup the past season, (because I didn't have them), "as much fruit per acre as Wilson; the best thing seen of strawberries; nothing to compare with it in size, productiveness, vigor of growth, hardness, or flavor; combining more good qualities than any other kind."

Piper's Seedling—One western grower of many years, experience, "has planted more of this for market than all other varieties combined." It is "large, productive, early and firm berry;" "season rather late;" "stands the trying winters of Illinois remarkably well."

Plant "Seneca Queen" for quality. One L. I. cultivator who has an acre of this, says it is best of all. While Peter B. Mead says: "Jersey Queen" is best and the true ideal type of the perfect strawberry, the largest and most vigorous plant ever seen, thriving under

all circumstances, firm, brilliant and beautiful, melting, high-flavored and luscious. "(Oh, how my mouth waters.)" Never falters in drouth and heat; passes unhurt, when nearly every other variety is winter-killed; takes the first prize at Gillmore's Gardens after three days on exhibition, yet in fine condition. This I think should have been called "Wonderful," perhaps the "Jersey" attachment may help it among stock men.

But the most delicious strawberry known, says an eastern firm, is "Pautuxet," measuring four inches, productive, spicy, sweet, very juicy, delicious, perfect.

Finch's Prolific claims to be the best market berry produced in twenty-five years; good flavor; keeps six days after picking; no juice in handling; very firm; holding its size to the last; perfect blossom; vigorous, hardy and prolific.

"Longfellow," says one, "is *enormously large*, giving good pickings for three weeks, and has more good qualities than fifteen other choice kinds."

Most of the above quotations are taken from eastern growers, many of whom are considered of sound mind and usually reliable. Just think of a strawberry weighing a pound, measuring 14 inches, only 1 to the quart, 1,000 bushels to the acre, never winter kills, needs no cultivation, in bearing six weeks, will keep a week after being picked, and of the most exquisite flavor. Some of this talk is hard to believe, but from what little fruit I have seen of some of the kinds, I am fully convinced that the best of them will produce berries that many of them will weigh a pound.

While we are waiting for that "good time coming," which is almost here, let us plant a thousand acres of "Countess." Of this pickers have picked from 150 to 239 quarts in a day. I saw the record last June of one picker who had tallied 112 quarts in 6 hours and another 80, and they expected to add 10 to 20 quarts each to that afternoon's pick.

This variety was sent out from Washington. It very nearly resembles Downer's Prolific, but the great quantity that pickers can gather, leads me to believe it is a new and distinct variety well adapted to light soils and near market.

"Crescent" has paid me the best in the last five years of any kind I have thoroughly tried. From 100 plants cultivated one year, one boy picked 100 quarts in 9 hours, and that same row produced not less than 500 quarts that season. This variety is well adapted to all soils, but especially sandy soil, and a plantation I turned under last spring after three years' successive crops, gave

me at the rate of 1,200 bushels of carrots per acre without any additional fertilizers. Still I should not expect it would succeed with the ground covered four feet deep with manure. As this is early and a pistillate, we have been looking a long time to find the "Bidwell." This seems to be just what the Crescent needs, and if those who have but little time to cultivate will plant these two kinds, they will not regret it. Peter B. Mead says of the Bidwell: "A larger crop than any other in my collection," and Chas. Downing says, "Early and most productive of all."

When we have two as careful men as these giving such recommendations, we can tie to the kind and plant a thousand acres.

Of profitable acres we have the record of Boyden producing 327 bushels, 15½ quarts. Sold for \$1,386.21. Again by another cultivator Boyden and Great American gave \$1,181.00 from one acre. The same cultivator gives the cost of one acre grown, picked and marketed as \$350.

My estimate would be as follows:

Cost of 14,520 plants @ \$5 (set 2½x1 feet).....	\$72 60
Seven days planting.....	10 50
Mulching at planting.....	5 00
Cultivation the first summer.....	100 00
Winter mulching.....	20 00
Spring care.....	5 00
Cost of plants standing one year.....	\$213 10
Cost of boxes and picking 400 bushels @ 2 cts. per quart.....	256 00
Cost of growing and marketing first crop	\$469 10
400 bushels sold @ 8 cts per quart.....	\$1,024 00
Net profit first crop.....	\$554 90
Second years' care and cultivation.....	\$50 00
Second years' boxes and picking 400 bushels.....	256 00
	\$306 00
Second years' crop sold @ \$3 per bushel.....	\$1,024 00
Second years' net profit.....	\$718 00

In these figures I have not added the cost of 40 tons of manure, or preparation of ground before planting.

I have given above a list of varieties, with which if half said of them is true, any man may make his fortune.

That the varieties are ever changing, one needs but to look at the list of 400 names of strawberries given by Chas. Downing, only 16 of which are now in cultivation. We need a new list every six months. I will add a few other kinds that have paid me abundantly well: Captain Jack, Green prolific, Chas. Downing, Cumberland Triumph, Sharpless, Downer's Prolific, Red Jacket, Mt.

Vernon or Kirkwood, Kentucky, Warren, Miner's Great Prolific and Glendale.

I might add many more but we are looking for something that shall supercede such poor kinds as the Wilson and small ones like Sharpless.

SOIL AND LOCATION.

Any soil from clean sand to heavy clay; make it a little too rich for corn; any location where water will not stand, but the best location is near some city where your berries will always bring 25 cents per quart.

There is one market that you can all have that will pay you even better than this: that is the "home" market. One pint each to each member of your family, three times a day, for thirty days, and thirty-two quarts to each person, canned for winter use.

In setting a small bed or a large plantation, get your plants as near home as you can, provided they are pure and good; never set an old plant as a gift; never dig from a bed where the kinds are mixed or run out. Set three to five rows of hermaphrodite or perfect flowering kinds to the same number of pistillate varieties. Never set these last kinds alone.

Distance apart, if to propagate plants 4 ft. x 4; if for matted rows 4 ft. x 1 or 2 ft.; if the "hill row" system $2\frac{1}{2}$ x 1 ft. In all cases it is best to pinch out the fruit stalks as fast as they appear the first season—although I have grown fruit enough the year of planting to pay cost of plants and tending—it so weakens the plants it is best to take them out. Set your plants level with the surrounding ground, putting the roots down in as near natural position as you can. Let no manure come in contact with the roots. I have known bone meal used as a puddle to kill the plants; press the earth firmly about the plants, mulch immediately to protect from frost, sun and wind, putting it about and over the plants. Start the cultivator, made up of one-half inch steel teeth one week after planting, hoe light and hoe and cultivate every week till frosts in the fall stop the baking of the soil and the growth of weeds; in matted rows cover lightly the joints and so place them that they shall be six inches apart; after the ground is half covered, pinch off all other runners.

In the "hill row" system pinch off all runners except to fill vacancies.

WINTER PROTECTION.

As soon as the ground is frozen cover the plants and spaces

between the rows about two inches deep with clean straw, leaves, evergreen boughs, marsh hay, or best of all sorgum stalks from the sugar mill.

Spring treatment for early fruit; remove the mulch, cultivate lightly, replace the mulch, tucking it nicely under the plants and fruit.

For the main crop poke off just enough mulch so the plants can get through, hand weed sufficient to keep down all rank growth till picking, after which cultivate and keep clean. After second crop if the ground is foul, turn it under.

If you are growing for market, you should have your boxes all ready before picking time.

For the past two years I have used a conductor's punch and a card like this:

Hole ☐ for string
Name.
Date.

A	A	A	A	A	1
B	B	B	B	B	2
C	C	C	C	C	3
D	D	D	D	D	4
E	E	E	E	E	5
F	F	F	F	F	6
G	G	G	G	G	7
H	H	H	H	H	8
H	H	H	H	H	8
H	H	H	H	H	8
H	H	H	H	H	8

The letters all punched out will indicate 300 quarts. A string at the top will suspend it to the neck of the picker who keeps it till pay day.

In the last thirty years I have not had so near a failure as on one acre of new ground, cleared of black oak, wild crab and hazlebrush ten feet high and one inch in diameter, strong, light soil, rich in leaf mould, planted one year after breaking with old standard varieties and choice new kinds, and after three years' faithful trial, having a good stand of plants and good bloom, the best kinds failed to produce over fifty bushels per acre, while on adjoining land twenty-five years to crops without manure produced with less care 265 bushels by actual measurement per acre, in an unfavorable season.

On a portion of this new land when the strawberries were turned under last spring on sixty-five rods of ground I harvested 12,400 pounds of sugar cane for the mill; 4,600 pounds small cane seed and fodder. The yield of the cane to the mill was ninety-two gallons of choice syrup; so that in my riper years I have been more successful "raising Cain" than when a boy.

Wyman Elliot. I was with Mr. Kellogg last June when he visited the strawberry plantation where the big record of a day's

picking of Countess was obtained. It is a variety that seems specially adapted to sandy soils, and takes the lead at present in Hennepin county. (In answer to an inquiry,) I am inclined to think it is a distinct variety and not the Downer.

Mr. Pearce. I think they are conceded to be identical with Downer's Prolific.

President Sias. A neighbor of mine has tried it on a heavy clay soil, and finds it his best variety.

Mr. Pearce. I have experienced largely with different modes of setting, and prefer the dibble plan, putting the roots straight down without any root pruning. They withstand drouth better and do better every way. I can set them in this way quicker and easier, and shall practice this plan entirely hereafter.

Secretary Gibbs. The dibble is a very useful garden implement, and as they are not for sale at the stores, I want to tell these farmers how to get them cheaply. Go to any good-natured railroad section boss—one to whose crew you have given a basket of fruit in time past—and ask him for an old worn out shovel. He has plenty lying around his tool house. Cut off the handle, get your blacksmith to make the blade, and put your shovel handle to it. Any nurseryman will show you a dibble to use as a model. It is handy in all plant setting.

President Sias. One of the best materials for strawberry mulching is sorghum bagasse.

Mr. McHenry. I would like to have some one tell me how to get rid of it.

Mr. Elliot. Cultivate in rows, and place the bagasse over the rows for winter protection. In the spring rake it between the rows.

Mr. Pearce. The bottom of an old stack of marsh hay is better. Would rather have no mulch than use any material infested with foul seeds.

Mr. Jewett. A neighbor of mine put out three acres of strawberries, cultivated well the first summer. Did not cultivate afterwards or do any mulching. Mowed off the weeds. His first picking sold for over \$1,000; second picking yielded him \$800. This beat all strawberry raising for the small outlay of labor that I ever heard of.

Secretary Gibbs. A man may sometimes strike it by this slipshod culture if his soil is clean to begin with, but it is not to be recommended. After twenty-six years' experience, I am for clean culture of the strawberry.

Mr. Brimhall. The best way to prolong the season of fruiting is to have a part of the field mulched with marsh hay or some other light material, and not take it off, but let the vines grow up through it. When necessary to get rid of such a mulch it can be safely burned off before the frost is all out of the ground.

Mr. McHenry related an instance at Rochester where a crop was destroyed by burning off the mulch.

Secretary Gibbs. "That depends." An old grassy bed can be burned to advantage early in the spring, or other beds when the mulch is light and dry and will go in a quick blaze; but if you have a mulch that will make a slow or hot fire, I would give the advice that Douglas Jerrald gave to the young people about to get married. "Don't."

Mr. McHenry. Sometimes too the practice of leaving the mulch on through the fruiting season will prove disastrous. I tried one acre this way, out of a three acre field, and got fifty quarts from the acre only. The other two yielded well.

Mr. Grimes. I take off the mulch with a horse rake. Then hoe and hand weed. After picking run the mower over the field, rake off, and then go over it with light harrow. Do not mulch the second winter, but harrow again in the spring. It may look as if the plants are all destroyed by the harrow, but they will come on and set plenty of blossoms and bear well. His experience with new and high-priced sorts—say \$1.00 per plant, had not been favorable. He gave an amusing instance of one plant he had sent for.

Mr. Underwood. A single plant was hardly a fair test.

Mr. Grimes. The test was satisfactory—I had enough of it.

Mr. Cutler. Has any one had experience in hill culture?

Mr. Brimhall. I find that old plants winter kill in hill culture.

Mr. Pearce. It is wrong to let plants fruit the first year. I plant late and take off the buds when I am setting the plants out. There is more danger and more labor from early than from late planting. Only pull off the buds or blossoms, strip down the roots and drop them into the hole made by the dibble. Distance depends on variety. Wilsons, close; Crescents, two and one-half feet.

Mr. Cutler. I set three and one-half feet and cultivate both ways.

Mr. Underwood. Many plants are killed for want of leaf prun-

ing at time of setting out. Would advise clipping off all but one or two leaves.

Mr. Elliot and Mr. Pearce agreed with Mr. Underwood.

Mr. McHenry. The leaves should be stripped downward, not clipped; otherwise the stubs would exhaust nearly as much vitality as the whole leaf if left on. Would not allow more than three leaves to remain on the plant in setting out. He had been disappointed with Bidwell. Got his plants from E. P. Roe. Blossoms, perfect.

Mr. Pearce. I think the Bidwell a poor plant.

Secretary Gibbs. Mr. Cutler asked for information about hill culture. It is not generally profitable. Still, with the right varieties you can grow larger and better fruit. Even the Wilson, which is not rated as the most vigorous grower, may by hill culture on good soil and runners all kept off, be grown so that a single plant cannot be put out of sight by a bushel basket, and bear 250 berries the second season. I have had a bed of 800 such plants. Rows about three feet apart, ridged up like a well hilled potato row, and the hollows filled even full with green cow manure. Young chickens in the spring to run under the foliage and take the cut worms. Affidavit furnished if required. Perhaps there was now and then a hill not quite so large, but not many.

Mr. Cutler. Is not 300 bushels to the acre a big story?

Secretary Gibbs. Yes, but may be true. J. M. Smith, of Green Bay, President of the Wisconsin Horticultural Society, has a record of nearly 450 bushels of Wilsons to the acre. He is coming to-morrow and will confess it, under torture.

Mr. McHenry had exceeded that rate on a few rows.

Secretary Gibbs. I have a paper on a new insect threatening destruction to the strawberry plantations of Minnesota which you can have now if you want it, or it may go over to be printed without reading.

Several members. Read it.

President Sias. We should be glad to have it in this connection.

THE STRAWBERRY LEAF ROLLER.

Anchylopera Fragariz, Walsh and Riley.

BY OLIVER GIBBS, JR., LAKE CITY, MINNESOTA.

This is an insect which, although not new to entomologists, has recently made its appearance in large numbers in Minnesota, and is now threatening every district in the State where strawberries are extensively grown. After twenty-six years of strawberry cultivating, I can say of it that it is the most nearly omnipotent little villain that has come around to vex the business. It makes no difference how large the fields, when it comes in earnest it sweeps them like a fire, and can drive the strongest of us out of the strawberry market unless we can find some wholesale means for its destruction. I first discovered its works last summer in a half acre patch on my place in Lake City, at about the time the berries began to set. What first attracted my attention was that something was folding the leaves of the plants, causing them to look dry and shriveled and that the berries were not coming forward to maturity. I then, on closer examination of the plants, found the worms in all stages of growth. There being myriads of them at work, I sowed a barrel of salt on the patch as soon as what little fruit they left me was gathered, and then plowed the vines under, but the insects soon after made their appearance on newly set plants in another part of the same field, and although not so numerous, continued their work without intermission till the first hard frosts in October.

Prof. Riley says in his first Missouri Entomological Report, that he first heard of the strawberry leaf roller in the summer of 1866, when it did considerable damage at Valparaiso, Indiana, and destroyed ten acres of plants, belonging to R. N. Strong of that place, so completely as not to leave plants enough to set half an acre. In 1868 they entirely destroyed a strawberry patch at Princeton, Illinois, containing several acres; and Mr. W. E. Lukens, of Sterling, Whiteside county, Illinois, in forwarding specimens to Prof. Riley, said: "Where these insects are thick, I would never think of raising strawberries. It is strange that I

have not noticed any of their work on this side of the river ; while on the south side for a mile up and down, they are ruining the crops of berries. * * * * A gentleman of the name of Kimball, at Prophetstown, had his crop a few years ago entirely destroyed by this insect, though it amounted in all to two or three acres. I hear of a great many men in other places having their crops burnt up with the sun, and have no doubt that it was this leaf roller and not the sun that was the author of the damage. As for myself I have on this account entirely quit the business of growing strawberries."

Prof. Riley, in the report above alluded to, suggested no means of destroying the leaf roller except to plow up the infested fields in the spring or fall so as to bury them while in the pupæ state. There are, however, one or two days in its existence when the worm lies exposed on the upper side of the leaf, and it is possible that it may then be destroyed by the application of pyrethrum or some other insecticide, but after the two sides of the leaf come together, the worm lies in there as secure from the application of powders or liquids as a soldier from shells in his bomb-proof dug in the ground.

In searching for the insect, when it arrives upon your grounds, you will first discover three or four white web-like bars at the base of the leaf on the upper side, stretching across the stem. Look closer and you will see a slim, light green worm from a twentieth to a sixteenth of an inch long lying close beside the stem under the white bars. Upon the least disturbance the worm wriggles away and disappears on the ground. Next day, if not destroyed, he will show you a further specimen of his handiwork. He goes on spinning the bars and pulling the sides of the leaf together, and in a short time they are seen flatly closed and pasted imperviously from base to tip. I have not held a watch on this insect or obtained his time table, but he goes on feeding upon the leaf till his appointed time for changing to the pupæ state, when he grows rigid in form, eats his way through the leaf, goes into the ground or under rubbish and re-appears as a night flying moth to deposit new eggs, to hatch into new worms, to fold and eat more straw berries, and so on.

Prof. Riley says there are two broods, one in June, the other in September; but mine were constant in their operations from spring till fall.

It is well to try the insecticides, but from some applications of strong medicines that I made last fall I am afraid that in the straw-

berry leaf roller we have an insect as hard to catch with poisons as are our educated prairie wolves and wild cats.

My only hope of saving my crop next summer is in the services of numerous broods of chickens that I intend to scatter in coops set here and there about the fields, and I indulge in this hope confidently for the reason that a neighbor of mine across the road from my place had quite a large home-use patch entirely free from the insects last summer, although his vines were grown from plants taken the previous year from my infested field. The only difference between his patch and my field was that he had a hundred or so of young chickens among his vines all the spring, while I had no feathered protection except from a few birds that had escaped "the slings and arrows of outrageous fortune" at the hands of our village boys. And this reminds me to remark that in wooded districts where birds are plenty perhaps this insect may be kept in check by them if the birds are permitted to pick an occasional berry to take the bad taste out of their mouths.

I have looked for descriptions of devices to capture the moths of the leaf roller and other night-flying insects by the use of fire lights to attract them; but have not found any. If anyone knows of a cheap and practical contrivance combining a light that can be left in the field safely and not go out and a vessel of water to drown the insects as they come to the light, I would be willing he should take out a patent on it.

QUESTION BOX.

Has *catalpa speciosa* been tried in Minnesota, and, if so, with what success?

Mr. Pearce. I have not found any healthy trees.

Mr. Elliot. I have known them to come to blossom, but they become diseased.

Mr. McHenry. I know of none over three years old. All my yearlings winter-killed.

Mr. Sias. I am afraid of them. Have tried them several years and failed.

What is the best way and time to plant beech nuts, and will they grow in Dakota?

Mr. Elliot would not recommend them for tree-claim planting. If planted at all it should be among other trees for nurses, as they are tender while young.

Mr. Pearce had failed to raise them, though well cared for.

Mr. Grimes thought our soil unsuitable.

Mt. Cutler had seen beech trees on sandy or gravelly soil, but not on black loam.

Will a fruit tree ever come into bearing while all its cells are alive and growing from center to circumference?

Mr. Pearce. No. A fruit tree with its cells all open and sap walls closed will always grow and never bear. They will never bear where there is no lime. Cells become filled when buds form and fruit is born.

Mr. Underwood. How can sap exude from dead wood?

Mr. Pearce. The wood may be inactive and still be alive.

Has any one in Minnesota succeeded with the Willow Twig, or any other long keeping apple in Minnesota by top grafting?

If so, on what stock?

No response, but question printed to be called up again.

What varieties have been successfully top-worked on Duchess, and what on Whitney No. 20?

Mr. Underwood. The Duchess grows too slow for a stock to top-work on vigorous varieties of the apple.

Mr. Phillips. Mr. Wilcox suggested Whitney No. 20 to top-work on. I budded two trees to Haas, and the union is perfect. Think No. 20 a good tree to top-work. It is thrifty enough for anything.

Mr. Pearce concurred.

Mr. Underwood. I have never heard Whitney No. 20 called a fast grower.

Mr. Phillips. Whitney No. 20, after the first year from planting in orchard is one of the most vigorous growers in the entire list. It has a wonderful tendency to throw out strong roots that will support any amount of top.

Secretary Gibbs. Prof. Budd, of Iowa, recommends Whitney No. 20 and Virginia for top-working for family orchards, using certain congenial sorts, but for trial of the new Russians he recommends to plant two-year old Duchess grown on hardy roots, and to top-work them the next spring. Similarity of races of trees and congeniality of sorts to be united must be kept in view in top-working. As the new Russians from the arid regions of the Volga

are slow growers, they must be top-worked on slow growers like if not related to themselves.

Can the blossoms on fruit trees be retarded in the spring by any means ?

Mr. Underwood. My experience in trying to retard blossoms has not been successful. Mulched 300 trees, and left alternate rows unmulched. Saw no difference. Sap flows in the maple when ground is frozen and snow is deep.

Mr. Pearce. Mulch on snow will hold in the frost and keep vegetation back. Have known mulching with chip manure on trees that seemed dead for a while. When the manure was removed they started into growth.

Mr. McHenry. My experience is the same as Mr. Underwood's. I think the only way to keep trees back is to mulch top and all as we do strawberries.

The secretary offered the following resolution, similar to one adopted in the Illinois Horticultural Society, on the careless handling of fruits by agents of express companies, which was adopted :

WHEREAS, The careless handling of small fruits by employees of express companies is the cause of serious loss to growers, therefore,

Resolved, That this society respectfully suggests to the superintendents of express companies the issuing of instructions to their employees to exercise special care in handling this class of goods.

Resolved, That copies of this preamble and resolution be forwarded to such superintendents, and that they be requested to furnish the secretary of this society with a copy of such instructions as they may issue for the information of its members.

The Secretary. I have a paper from Sidney Corp, of Wabasha county—Post-office, Hammond—giving a farmer's experience in raising apples in Minnesota. Mr. Corp is one of the most successful orchardists in our county.

The President. If you have anything of that kind from Sidney Corp, it is valuable, and we will hear it read if there is no objection.

A FARMER'S EXPERIENCE IN ORCHARDING.

BY SIDNEY CORP, HAMMOND, WABASHA COUNTY, MINN.

Mr. President and Members of Minnesota State Horticultural Society:

Through the repeated solicitations of your Secretary, I here give my experience in raising apples in Minnesota, not as a rule for others to follow, but simply as my experience, practice, and preference. My first experience in trying to raise apples in Minnesota was a failure, but by profiting by past experience, and persistent effort, I have succeeded in raising some very fine apples. I raised enough this year to supply the local demand during the season of my apples, and also shipped a few barrels of Duchess of Oldenberg to Dakota, which arrived there in good condition, and brought me a good price. First, and foremost, in raising apples in Minnesota, I prefer high ground with a north slope, then a good wind break, I mean a belt of tall, strong timber, that will break off the big wind storms, and prevent them from blowing off the apples; not simply a hedge, which only hinders a free circulation of the air in the orchard, which I think, is necessary to the health of the trees. In selecting trees I get those that have a good, thrifty center shoot, suitable for high trimming, and trim them up four feet from the ground; this I do when I plant them out, and never after let a sucker or bud grow below this line. This is a tender spot with some men, but with me it is a fixed rule. My reasons for high trimming are two fold: first, it gives me a chance to cultivate freely with a horse, and secondly, it allows the sun to shine on the ground around the roots of the tree, which, I think, is necessary to the health of the trees. Then in planting my trees, I lean them very much to the south-west, this I do so that the rays of the sun will loose a part of its force by striking the body of the tree more obliquely in the hottest part of the day, and also to make the top the heaviest on the south side. I manure the land, and raise a crop of beans, or potatoes, among the trees until they get big enough to shade the ground so that vegetables will not grow any longer under them; then, I continue to cultivate and manure the trees like any other crop, using all my leached ashes around the

roots of the trees. To prevent mice from destroying the trees I remove every particle of grass and weeds from around the tree so that the snow will lay flat on the ground around the tree. I have never had had one girdled by mice since practicing this. And to keep the rabbits from gnawing the trees, I use a white wash made of three parts of lime and one part sulphur; use water to slack the lime, and skim milk to thin up the white wash. There is one thing more that I wish to mention here which I have thought might have been the cause of my raising apples some years when my neighbors failed to raise any. There is sometimes a rain storm in the winter, and yet be cold enough to freeze the water on the trees until they are completely covered with ice. This, I think, is the most dangerous time for the fruit buds. I have made it a practice at such times to watch close, and the very first time it thawed enough to loosen the ice on the trees, give each one a smart shake, thus ridding it of its icy shroud, so that the buds and limbs would dry off before another cold night should come and freeze it solid on them again.

The varieties of apples I raised this year were Duchess, Wealthy, Hass, Red Astrachan, Tetofsky, and two seedlings; of Crabs, Transcendent, Hyslop, Beecher Sweet, Palmer's Sweet, Hutchinson's Sweet and Early Strawberry.

In regard to the Wealthy apple about which you inquired, I am not able to form much of an opinion as I have only a few trees old enough to bear. My trees do very well yet, but they show a little sign of blight. I have 150 growing; shall plant 100 more this spring. I plant them in preference to any with which I am acquainted. I send to your winter meeting two specimens of seedlings of winter fruit, one of my own raising and one that grows on a farm owned by Mr. Wilkey. My seedling tree is ten twelve or years old, but it never bore until this year; the tree is a little dwarfish and the apples are rather under size but very good. It bore sixty apples this fall and not one of them shows any sign of rotting yet. The other is a medium size apple, a good cooking apple and a first rate keeper, and has been an excellent bearer. The tree was planted by Samuel Fanning about twenty-five or twenty-six years ago, as near as I can learn—at least it was planted out in the orchard when I moved to this State; that was in 1860, and it has been abused in every way that it is possible to abuse a tree and still it lives, out on the open prairie alone, all the other trees dead and gone and nothing to keep it company but the cattle and horses that stand under its shade and stamp on its roots, and yet

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this old tree bore enough apples this year to enable the man to sell two barrels besides what he kept for their own use. One barrel of these I bought myself, out of which I furnish specimens to send to the meeting. As to wood of the tree I know nothing, as I have not seen the tree for two or three years. Mr. Pearce wrote to me last fall about the tree, and I inquired of Mr. Wilkey. He said it was failing. Mr. Pearce visited the tree some years ago, and possibly has propagated some from it. I have no interest in the tree but what is common with you all, but believe it has some merits as a long keeper. Mr. Wilkey gave me a few of the apples several years ago and I kept them and ate them in company with Mr. Burbanks in April, and found them in good condition.

HAMMOND, WABASHAW Co., MINN., December 29, 1882.

Mr. Pearce. I know Mr. Corp. He sets nothing but best varieties and takes the best of care of them. His location is good, and he is a very successful fruit grower. I am propagating the Wilkey Seedling. It is a winter apple, but the tree has a broad leaf, almost like the Tetofsky.

President Sias. I went to Mr. Corp's place several years ago on purpose to see his orchard. Found his trees all pruned high, four to seven feet. This is contrary to the doctrine that it will not do to trim in Minnesota. I sold him 100 trees, and he only took those that were high-headed. He exhibits the largest Duchess ever seen at any of our State fairs.

Mr. Pearce. Mr. Corp came to me and wanted to get such trees as nobody else wanted; that is, whip-stocks.

SECOND DAY.

Wednesday, January 17, 1883.

The report of standing committee on Seedling Apples being called for, the following was presented from J. S. Harris:

Secretary of Minnesota State Horticultural Society.

DEAR SIR: Unforeseen circumstances have interfered, and I shall be unable to present very much of a report on Seedling fruits. Several promising varieties were on exhibition at the State fair, but I have been unable to visit and examine the trees. Having heard of some trees at Caledonia, Houston county, I paid the place a visit a few days since, and find some trees where the wood shows marks of extreme hardness. J. J. Belding has two varieties of fall fruit, one sweet and one sour, that are very good. Wm. F. Dunbar has several varieties. Three of them will be on exhibition and will probably prove fair keepers. The quality is not as good as we desire, but the trees look fairly well and are worth looking after to furnish seeds for further experiments. Upon the exhibition will be found three varieties, marked Nos. 2, 3, and 4, from Spring Grove. I have not seen the trees or tested the quality. (Should like to have the society note the quality). In the orchard of Andrew Hartman, Hokah, Houston county, found three varieties. The trees of two appeared good; one very good. The best is said to be a long keeper and good bearer. Mr. Kramer, of La Crescent, is growing some Seedlings. I have examined the wood and found it very perfect. Could not secure any of the fruit, but am assured that a part of them are winter varieties. Just before leaving home I learned that H. P. Everhard has a healthy looking tree about twenty-five years old that the last season produced thirty bushels of apples; bears every year; fruit keeps well and is valuable for cooking; size about as Fameuse. I have the promise of some

of them, but will not be able to get them to this meeting. I am now making our wants known through the papers, and have heard of some others, but being called so suddenly from home must let them lay over for investigation the coming year. While I have not found what I am looking for, I have reason to believe that good results will yet come from looking up our Seedlings. I have already found some that are standing better than the Wealthy and will keep longer, and some of them may yet be of considerable value. My seedling of the Transcendent crab is a marked evidence of the susceptibility of the Siberians to improvement.

Please to accept this for what it is worth, and upon my return I will duplicate and improve it.

Yours, &c.,

JOHN S. HARRIS.

The Secretary. Mr. Emery being absent I will report for him, but prefer to do it at some future time when we can have the apples displayed on a table in front of the audience so that each specimen can be seen when the description of tree and fruit is given.

Mr. Pearce. And I, too, will wait for that occasion. We have a promising lot of seedling apples here, and it is desirable to call especial attention to them.

Mr. Phillips then read his paper on

TWO YEARS IN ORCHARDING.

BY A. J. PHILLIPS, OF WEST SALEM, WIS.

By way of introduction to this paper I will say that my location, just back of La Crosse, is similar to the country on your Minnesota side of the river in that section. I have attended your State exhibitions and horticultural meetings, and find them of more value to me than the exhibitions and meetings in Wisconsin, because your varieties and conditions are more nearly like ours in Northwestern Wisconsin. When called upon by Secretary Gibbs I at first declined to write a paper, but he reminded me that he had read my *Ten Years in Horticulture* in the Wisconsin report, and suggested that I begin here where I had left off there, and as I had had some new and perhaps valuable experiences in these other two years, I adopted his suggestion; hence the title of this paper.

As the spring of 1881 approached I must admit that from obser-

vation in my own and reports I received from other orchards, I began to fear that the winter of 1880-'81 had been equal, if not worse, in its effects on apple trees, than the memorable winter of '72 and '73 ; but as spring approached, on close examination, although the trees were much exhausted, I found they had not suffered as much as I had expected.

Being very busy with other business in the spring, I rented my farm and orchard with it—had one hundred trees set—and for four months I gave my orchard very little care. But as fall approached I made arrangements to drop other business and give my whole attention, for a while at least, to farming, stock raising and fruit growing. I began by looking around to see what varieties of trees had withstood the past winter, and came out with sufficient vitality to bear fruit in the summer of 1881, not only in my own but in orchards in my neighborhood. This I concluded would be a good criterion to guide not only my own but the efforts of others in future apple tree planting. I found Whitneys No. 20, Orange and Transcendent Crabs bearing fair crops. Also found the Duchess, Wealthy and Utter were reasonably filled with fruit, but not of as good quality and size as the year previous. I found two winter seedlings that are on my grounds bearing, one for the first time and the other for the twelfth consecutive season, the last having on about one barrel of very good sized apples. Of course this increased my faith in these. I found the Fall Orange bearing in some very unfavorable localities ; also the Fameuse, though it plainly showed signs of exhaustion, I found it had rallied and was bearing some fruit. But poor Ben Davis, though it had tried hard to stand this climate and be profitable, had finally, except a few trees, given up the ghost ; also Rawles, Janet, Jonathan and Red June had shared the same fate. I found the Atwood, a seedling originated by Dr. Atwood, of Trempeleau county, Wisconsin, (and of which I have fruit here on exhibition, and for which your committee awarded a first premium at the state fair last fall as a winter seedling) looking very vigorous and bearing for the first time a very few apples. This tree I had been watching with some anxiety for the reason that although the trees looked fine, Uncle Wilcox had informed me that the parent tree was dead. But for the purpose of smoothing over the feelings that are the usual result of disappointments in these trials, and increasing and stimulating our future hopes, he added, " Well, that is not fatal, for the old Wealthy tree is dead too." I find where men are determined to succeed they always try to put the best side out and

smooth disasters over. I grafted last spring one hundred of the last named variety, and sent ten of the young trees together with ten each of my two seedlings I spoke of, to my friend Sias, to be tested in Minnesota, and if they prove of value they will be an acquisition to our list, if not, they will not be sold; but I shall still cultivate them, as I am satisfied they will be profitable for me, as they are all good keepers and a fair quality of fruit. I found no time in the fall of '81 to attend any fairs, only our own county, where I made a good show of apples. Since November of that year I have attended personally to my orchard and nursery and have been a close observer, and have spent some time in visiting other orchards and nurseries. I gave my trees the best care in 1882 that they ever received and they amply repaid me for the trouble. My fruit while on the trees was a sight worth going some distance to see. Crabs that were loaded were Whitneys No. 20, Transcendent, Hyslop, Minnesota, Orange, Conical and Early Strawberry; of apples, Wealthy, Duchess, Fameuse, Haas, Walbridge, Pewaukee, Atwood, Alexander, Wolf River, Fall Orange, Tallman Sweet, Fall Stripe, Price's Sweet, Plum Cider, Uttter, St. Lawrence, and both my seedlings, all bore full crops and many were loaded too heavy for the trees. Had many others that bore some apples.

I attended your State Fair with a show of apples. Next week after I attended our County Fair with a better lot, next attended the Jackson County Fair, and last of all, Oct. 5th, a month after your State Fair, I made the best show of the season at Monroe County Fair as apples had grown larger, and were colored and much better than at any previous fairs. At all these places I received a fair share of the premiums, and enjoyed visiting and comparing notes with other fruit growers very much. It is my candid opinion that there is no business that men become more attached to, and the love for the business increases faster, than that of the fruit grower in this climate where such persistent effort is required. Trees went into winter in good shape the past fall, cold weather came on gradual, trees ripened their wood nicely, and shed their leaves early. And even should we have a severe winter, I have no fears of injury to our hardy varieties. In '72, when the mercury went below zero early in November, was the time that thinned out our tender kinds, and set nurserymen and orchardists to looking about them for something better. Which I think on the whole, was a good thing, though hard for some to bear. Like many other growers, I had a large proportion of fall apples, which I was obliged

to market as fast as possible. My Wealthies and part of my Whitneys No. 20, I sold in Minneapolis, others I sold in La Crosse, Rochester, Eau Claire and Wausaw. Although the general complaint in this section was that the frost had killed all the fruit, when time for marketing came it was found that the high lands of La Crosse and Vernon counties, in Wisconsin, and Houston county, in Minnesota, were supplying an abundance of fine fruit for the La Crosse market.

I set about four thousand grafts in the spring of 1882, of the following varieties: My three winter seedlings, Duchess, Wealthy, McMann's White, Tetofsky, Whitneys No. 20, Utter and Orange. Set five hundred trees in orchard, which all grew but four; they consisted of Duchess, Wealthy, Pewaukee, Waulbridge, Fameuse, Golden Russet, McMann's White, and Whitneys No. 20. Will set about the same number in spring of 1883, of the same varieties, adding Atwood and two other seedlings, also Wolf River of my own, and in addition will set of Minnesota seedlings, the Rollins Russet and Elgin Beauty. For trial, last fall I put in about five hundred buds, using for stocks, Transcendent, White Arctic, Whitneys No. 20, and Duchess. Budded my sweet seedlings—Blue Pearmain, Herfordshire Pearmain, Sops of Wine, Pewaukee, Rawle's Janet, Willow Twig and some winter seedlings from the western part of this county; so you will readily discover I am after more winter apples.

I fruited the past season the Doylestown, a seedling of Columbia county, Wisconsin, and the Wolf River, a seedling of Waupacca county, Wisconsin, for the first time, and am well pleased with the fruit and trees of both kinds.

In my travels for observation this winter, I found a seedling tree in an adjoining town that was set in 1852, thirty years ago; Never had a knife or saw used on it; bears a small winter apple of good quality for cooking; bore in 1880, twenty-five bushels, and 1881, thirty bushels; but the frost killed the bloom in 1882. But the tree looks fine, is about fifteen inches in diameter. Will watch it next season, and if I consider it of value, will propagate and report.

Found one man that when he settled here twenty-three years ago, was so determined to raise fruit, that he walked in two days, over seventy miles and carried seventy, one and three-year old trees home on his back, and some of those trees are still bearing good crops.

I find the Tallman sweet and St. Lawrence, are staying with the

farmers about as well as any of the old varieties, although the Fameuse has more friends than any other one variety.

The large exhibitions at fairs, and especially at your State fair last fall, convinces me that the interest in fruit growing is increasing in the Northwest.

And as I have given you a brief account of my working and experience in this branch of horticulture for the past two years, will close by wishing you all success in the year 1883.

Mr. Pearce. Did the leaves drop early on account of ripening of the wood or from drouth?

Mr. Phillips. I think it was from healthy maturity. Frost came about October 20th, and leaves were falling. Orchards 450 to 500 feet above the valley, and frost holds off longer. Atwood seedling is of fair size and quality, and is a keeper. Where the original tree grows, the soil is black and location in the valley. Tree is 30 years old, and bears heavily. Does not indicate any crab blood. Whitney No. 20 suits me better for preserves than any other variety—better than peach, but my wife says peach is best. I shipped Mr. Elliott some of the fruit for market last fall and he says they gave good satisfaction. Some folks say I have Whitney No. 20 on the brain, but I like the variety. Season with us about September 10th to 15th. In northern Illinois it ripens in August.

Mr. Bussee. They ripened with me September 13.

Mr. Phillips. Never saw any blight on Whitney No. 20. Think blight is contagious.

Secretary Gibbs. Mrs. Wileox, of La Crosse, told me last winter the Whitney No. 20 was the best for canning of all the crabs.

President J. M. Smith, of the Wisconsin Horticultural Society, having arrived, was introduced to the Society. Mr. Smith excused himself from any extended remarks, but said he would read his paper on Market Gardening whenever the Society should reach it in the program.

Revision of fruit list called for, and after a desultory discussion on varieties, and the adoption of Duchess, Wealthy and Tetofsky for general cultivation, a motion was made by the Secretary, to district the State anew for all fruits to be recommended, as follows:

- 1st. For General Cultivation.
- 2d. For southern and southeastern Minnesota.
- 3d. For northern and western Minnesota.

Mr. Fuller. I am inclined to favor that motion. Eight varieties are all that can be grown in my section—the prairie district west

of the big woods. More can succeed on the Mississippi river bluff locations and in the southerly part of the State.

Mr. McHenry. The southeastern being timbered is probably better adapted to fruit raising than the southwestern.

Mr. Sias. I was formerly of that opinion, but now prefer elevated sites on the open prairie.

Mr. Pearce. Locations on eastern shores of large lakes are also favorable.

Col. Stevens. Carver county grows more good fruit than any other section. There are many farmers there who take good care of their orchards and understand their business. It is a great pity we do not see more of them at the meetings of this society. One man has thirty or forty varieties—some Russians—exceeding anything heretofore thought possible.

Mr. Pearce. We had better designate localities than draw lines of latitude.

Prof. Porter. I wish to support the motion, but would recommend an additional division "for middle Minnesota." There is little difference in altitude and soil; only variation is in latitude. Sorry to differ with Mr. Pearce. Latitude alone affects temperature. Records show great variations of temperature between sections on different latitudes. Would include all fruits and give a general list, and a specific list for each of the sections. He suggested the following as the divisions.

- 1st. For general cultivation.
- 2d. For southern Minnesota.
- 3d. For middle Minnesota.
- 4th. For northern Minnesota.

Secretary Gibbs accepted that as an amendment to his motion.

Mr. Pearce. Condition of the air, as to moisture or dryness, affects fruit culture as much as temperature.

Mr. Fuller. Fruit lines do not run east and west. I am eighty miles west of the big woods. Beyond me is the open prairie, a treeless region stretching away to the Rocky Mountains. Winds affect the trees more disastrously in these wide prairie sweeps, and the fruit list must be restricted there to the hardiest kinds. When I get orders for trees for that country that I know are not suitable, I refuse to fill them.

Prof. Porter. Timber belts should be planted where there is no natural protection.

Mr. Bussee. It is more with men than with trees. I have

traveled in the west and found varieties alive and doing well in one man's care, and dying or dead in another's for want of care.

Mr. Sias. Those orchardists in Carver county are largely Germans, educated to take good care of trees. The success there is more due to this than to the varieties or location.

The motion of Secretary Gibbs, as amended by Prof. Porter, was then adopted.

The following is an abstract of the discussion on varieties while the foregoing motion was pending :

President Smith inquired if Grimes Golden could be raised in Minnesota. Charles Downing calls it the best apple in America. It is not very hardy, but does fairly well in Wisconsin, and if we can make two trees live out of ten or twenty we think it pays to raise it for its delicious quality. We also raise excellent Bellflowers in the vicinity of Green Bay.

Secretary Gibbs. The best pear orchard in Wisconsin is at or near Green Bay, but on elevated land, and has the ameliorating influence of the large body of water contiguous. Much tenderer varieties can be raised there than here, though on the summits and northerly slopes of our river bluffs I think almost anything can be raised by top working on hardy seedlings if we can get them.

Mr. Pearce. Fifteen years ago the yellow Bellflower was bearing in Olmsted county. It is an excellent variety and I intend to try it again. It did well up to the year 1872-73, when the trees mostly winter-killed, and it has not been popular since.

Mr. Brimhall. I have tried Grimes' Golden Pippin and am convinced it is not hardy enough for this climate. All killed in winter of 1872-73. Location high, timber soil.

Mr. Pearce. I recommend a trial of Bellflower by nurserymen.

Mr. Grimes. I do not think the Bellflower hardy enough for this climate.

Mr. Phillips. That is my opinion.

Mr. Pearce. I can ripen it in less days than you can the Wealthy, and am not afraid of any variety winter killing if I can get the wood well ripened in the fall.

Mr. Brimhall. The time spent on half hardy varieties is worse than thrown away.

Mr. Grimes. Plumb's Cider stands well. Fameuse becomes black-hearted and feeble. Tetofsky is too slow a grower and not very desirable. Wealthy and Duchess and our new seedlings are the apples for Minnesota.

The Secretary. A. G. Tuttle says he has no further use for the Tetofsky since he became acquainted with Yellow Transparent.

Mr. Phillips. I set four Fameuse every year for my own use.

Mr. Sias. I set Fameuse twelve years ago. They are alive and in good bearing.

Mr. Pearce. I make it a business to travel and study fruits, and I find Fameuse in as good condition as any variety of fifteen years' standing. It does well here in Hennepin county, but is not suited to low locations nor heavy soils. We must study soils and the adaptation of varieties.

Col. Stevens. Apples have been raised north of 48°. I think some can be grown north that we cannot grow here.

Mr. Fuller. I would suggest a division for the fruit list, embracing the country west of the Big Woods.

President Sias. That section can raise fruit by planting wind breaks?

Mr. Phillips. Not one in fifty people know what varieties you recommend here. Tell them to plant what they find doing best where they live; that is the best advice.

Several additional motions were made relative to revising the fruit list, but none of them were adopted, and in the pressure of business afterwards no time was found to take it up again, and the matter goes to the executive committee.

QUESTION BOX.

Is not the Wilson's Albany strawberry the most profitable one to grow for market purposes?

President J. M. Smith being called upon for his opinion, said: "I have been growing strawberries for more than twenty-five years. I commenced before the Wilson was introduced. Have grown it twenty-two years and find nothing else so good. Crescent comes next. It is a good bearer, but too soft to ship. Hence market men don't like it. Have plowed under many Crescents as not being worth picking. Wilson is reliably productive. Have failed but once with it in over twenty years. I think the only cause of failure with Wilson is lack of fertility in the soil. It requires rich soil. Crescent does not. Sharpless has not done well

with me. Berries large, but few of them. Seth Boyden,s No. 30 I find to be the best in gaulity of the large berries, but cannot afford to raise it for market. Downer's Prolific is excellent for the table. Kentucky being a late berry is good to prolong the season of the strawberry. Capt. Jack is not prolific, will not yield more than half as much as Wilson; neither will any other except the Crescent—Crescent will give fruit with little cultivating, but Wilson is best of all, My soil is sandy loam, but very rich. Wilson yields 200 bushels per acre as a fair crop, 300 bushels would be a large crop. Have raised that many.

Secretary Gibbs. Mr. Smith, my reputation for veracity, or the accuracy of my memory is in question at this time. I stated last evening after the reading of Mr. Kellogg's paper that J. M. Smith, of Green Bay, President of the Wisconsin Horticultural Society, has raised the Wilson Strawberry at the rate of nearly 450 bushels to the acre. If that is not true, will you please to deny it?

Mr. Smith. I did pick in 1875 3,571 quarts on one-fourth of an acre. This is at the rate of 446½ bushels to the acre.

The Secretary. I trust anything I may say hereafter will be believed.

Mr. Smith. I always water in dry weather. Pump the water with a wind mill, hold it in tanks, carry it through the fields in iron pipes laid on the surface of the ground, and distribute with a hose. My facilities are not sufficient. It takes 1,000 barrels of water to irrigate thirteen acres.

The Secretary read the following letter from Mr. Stickney on Strawberry irrigation:

MILWAUKEE PICKLE COMPANY, }
WAUWATOSA, Wis., Dec. 28, 1882. }

Oliver Gibbs, Jr.:

DEAR SIR: Yours of 16th inst. duly received, and I would cheerfully respond to your request, had I any *real experience* to offer? All I might write would be *only theory* and with that people are already familiar. Since we have had water so abundant, the clouds have given us very seasonable moisture, leaving little necessity for irrigating. We commenced last summer on strawberries about half one patch, rather in *advance of the drouth*, but before there was any real suffering, we had abundant rains, continuing through the season, so that no marked results could appear.

On stiff clay soils, like all of ours here, there must be a thorough system of underdrains before irrigation can be successfully practised. On much of your soil it would be less needful. I have two

copies of your report, for which accept thanks. Will place the extra where it will do good. Should much enjoy being at your meeting, but it will not be practicable. Shall hope to see some of your members with us at Madison in February.

Cordially Yours,

J. S. STICKNEY.

Mr. Smith. I intend to put in a steam engine. My sons are using one, and laugh at me when I suffer from drouth. Their machinery has not cost as much as mine. \$400 to \$500 will probably cover their expense. Runners come out on one side of the Wilson; then we place them by hand around the parent plant in equal spaces, put on a little earth and let them go. Not much danger of getting Wilsons to thick. Only try to get one large crop from this variety. If not large, let them stand for two crops. Then plow under. Have had three crops from the Kentucky. Crescent might produce three crops, but I do not think I shall ever try any more Crescents.

Prof. Hall, of the State University, presented charts showing altitudes of Minnesota, and hung them up for the inspection of members during the meeting.

Mr. Smith. How many feet of altitude are equal to a degree of latitude as affecting temperature?

Prof. Hall. I will look the matter up.

AFTERNOON SESSION.

SECOND DAY.

President Sias recommended that ex-Lieut. Gov. Norman J. Coleman, of Missouri, and R. L. Cottrell, of Dover Center, Minnesota, be made honorary life members of this society.

The Secretary suggested that F. K. Phenix, of Delavan, Wisconsin, the author of the elaborate paper on Seedling Fruits in our last report, be included in the list, which was agreed to, and the three gentlemen named were then unanimously elected.

President Smith then took the stand, upon invitation, and delivered his address as per program.

ADDRESS ON MARKET GARDENING.

BY J. M. SMITH, OF GREEN BAY, WIS.

Mr. President, Ladies and Gentlemen:

I suppose that when your president and a few friends united together and invited me to deliver an address before you upon the above-named subject, they expected me to tell you something that would be both practical and useful. I shall certainly attempt nothing else. Whether I shall succeed in that or not remains to be proven.

In my remarks it is very probable that I may refer quite often to my own experiments, my successes, my failures, etc. In so doing

I do not wish to be considered as boasting of what I have done, or can do, and please do not so consider it ; but I refer to it because I can make myself better understood, and more practical in that way than in any other.

He who attempts the business of market gardening, and expects thereby to leap at once from poverty to wealth, will most assuredly be mistaken. There are no large fortunes lying ready made, upon this route, any more than there are upon the farm.

I have tried both, and know whereof I speak. In fact I believe that an ordinary farm will bear more neglect and still keep starvation at bay than a garden. Neither is the garden any place for indolent man. Such an one will surely come to an ignominious end. But if you are willing to labor and learn, make a long and continued effort to be successful, and to that effort add intelligence and good common sense, you will almost surely succeed in the end, and it is to and for such persons that this paper is written.

In the first place, how about the soil and location?

I prefer a light sandy loam to any other soil for our purpose. It will raise no larger crops than a heavy clay, or loam with a clay subsoil, but it is ready to work earlier in the spring, and you can get crops ready for market from a week to ten days earlier than upon the heavy soils, and this will very often make a difference between a crop with a fair profit, and one with an absolute loss. Hence we will select a light sandy loam, and if it slope somewhat to the south, all the better. It must not slope toward the north, and it must have sufficient fall in some direction to give us good drainage, or we are doomed at least to a partial failure from the start.

We will suppose that it has a slight descent to the south, and that it has been well and thoroughly drained the preceding fall. It should lie convenient to your market, not more than two miles at the furthest, and half that distance is very much better. Perhaps your place contains ten acres. That is plenty to begin with, and perhaps more than you need.

How about the manure? Have you plenty of that on hand, or near by where you can get it without an hour's delay? Still it is much better to have all on hand, and have it thoroughly worked over, and all ready for use. Now do not begin to tell me that your land is so rich that you need no manure. You have splendid land in Minnesota and so have we in Wisconsin, but neither State has an acre of land that is fit to garden upon, that will not be benefited by being heavily manured. Remember that if you are a good gardener you are taking two large crops, and sometimes

three of them from the land in each season, and if you do your work well, when the season is over your land is almost as naked and barren of vegetation as the desert of Sahara. No land can stand such a drain as this, for any length of time. Hence the necessity of manure and plenty of it, not less than 300 loads for the ten acres.

Now we come to the selection of seeds. This to me is about the most perplexing job of the year. We want the best and are willing to pay a good price for the best; but how are we to know. About New Year's the new catalogues begin to come to hand, with their list of seeds both old and new. The number and names of the varieties of beans, peas, radishes, potatoes, cabbages, cauliflowers, beets, carrots, turnips, etc., is absolutely bewildering,

When you come to put in your strawberry plants the case is, if possible, still worse. After many years of guessing and trying one new thing after another, I have adopted the following plan as about the best: There are certain varieties of almost all kinds that are known to be good and reliable. I select my supply from those, and then try some of the most promising of the new varieties very carefully and in a small way. Suppose I name a list of the most prominent of such as have done the best with me. Of asparagus, Conover's Colossal. Beets, for early, Early Egyptian and the Early Bassano. For main crop, the Blood Turnip. For beans, after trying many varieties I am now growing the German Golden Wax almost exclusively. I grow no pole beans except a few Limas for my own use. For carrots, the Short Horn. Cabbage, first early, the Jersey Wakefield; second, the Fottler, though for a few years past this variety has rotted badly, and we are now trying to find a substitute for it. Thus far the Newark Flat Dutch has come the nearest of any to supplying its place, and at the same time giving us something reliable for our late setting. Where you have rich land, and plenty of time, the old Premium Flat Dutch is an excellent variety; but it requires nearly the whole of our short season to mature its crop, and that is a serious objection to it. It also throws out an immense mass of leaves, and of course requires more room than some of the quick-growing varieties. For cauliflower, the Early Erfert is as good as any that I have ever tried. Celery, Henderson's and the Boston Market are both good. Cucumbers, the Early Frame and the White Spine. Sweet corn. If the Early Minnesota, Crosby's Early, and the Stowell's Evergreen are all planted at the same time, they will come on in the order named and give a regular supply through the season.

Melons—the Early White Japan and the Hackensack, among the nutmegs, and the Mountain Sweet among the watermelons. Tomatoes. Nothing has given me so much satisfaction as the Traply and the Acme. Peas. If you go by the catalogues you will have varieties by the hundred, each and all of them recommended as something excellent and very much to be desired. After many trials and much annoyance, I have for some years past been growing the extra early Dan O'Rourke as my main crop. For first early, Landreth's Extra Early is excellent, provided you get it true to name, which I have failed to do more than half the time for some years past. It is with me a poor bearer, and is only valuable on account of its crop coming on at once, and very early. For late crop and table use at home, I know of nothing equal to the Champion of England. Among the almost countless new varieties, the Bliss American Wonder promises well with me.

Potatoes. I have thus far succeeded better with the Early Rose than with any other. I know of no better parsnip than the common Dutch Yellow Crowned. Onions. For first early, you need a few Shallats. These are worthless except for a short time in the spring. Our second supply comes from the small onions grown from the black seed of the previous year. If you can get the little onions of the New White Queen, they are the best of any that I have ever tried, as they make a beautiful bunch onion, but are not desirable as a bushel onion. The next supply will come from the top onion as they are a little later than the White Queen. These should keep you supplied until your Early Red Globe from the black seed are ready for use.

For bushel onions, Early Red Globe, Yellow Danvers and the Red Wethersfield, I have found the most reliable.

Of radishes the Covent Garden, and the French Breakfast.

Of turnips, I find nothing quite equal to the Purple Top Strap Leaf.

Squashes. For summer the small Scollop, and for fall and early winter the Turban and the Boston Marrow. But for main winter crop, nothing gives me as much satisfaction as the Hubbard.

I have thus given a list of the most prominent of our garden seeds. I will not say that it will be entirely satisfactory to you, for it is not to me, but is about as near so as I can make it. Now about the garden tools. It will not do to wait until you are ready to go to work, and then lose time in getting tools together and ready for use. Plows, cultivators, harrows, rollers, spades, shovels, hoes, rakes, seed sowers, etc., must all be ready to use at a moment's

notice. The spades, shovels and hoes must be of the best of steel, and then ground to a fine edge and kept so. For rakes nothing but the best of the fine pointed steel ones will answer.

Well, here comes a pleasant day early in April. We find upon examination that the land where we propose to sow peas is entirely free from frost, and that it is in good condition to plow; and we will make a beginning at the season's planting. We will plow the land, spread the manure upon it after plowing, and harrow it in with a fine steel tooth harrow. Now take the shovel plow, and make furrows say three and a-half feet apart from center to center, and about four or five inches deep.

Take the seed sower and set it so that it will drop about one pea to the inch when you are upon a moderate walk with it. The bottom of the furrow made with the shovel plow will be six to eight inches wide. Sow a row upon one side of the bottom of this furrow, and then returning sow another in the bottom of the other side, thus making what we call a double row. Peas are one of the few seeds that the sower will not cover of sufficient depth, and we must put some extra cover upon them. Take a rake and it is very easy and rapid work to draw back some of the earth into the furrow, or, after sowing, turn your harrow upside down and harrow it over crosswise. After your peas are finished you have a space of nearly three feet between the rows. This land is not needed until the vines are nearly grown when they will shade and cover it or nearly so. Before that time we will have a crop of radishes out of the way. Take your sower and set it to drop about one or two seeds to the inch, and sow a double row of seed midway between the rows of peas. It is very likely that the radish fly will injure and perhaps nearly destroy this first sowing, still they will cost you but very little; and as soon as done pulling, go through with the cultivator destroying all weeds and give the ground to the peas.

If cold weather comes on and the ground freezes hard it will do peas no harm, and they will gain a little every warm day.

Just as fast as the land is fit to plow go on putting in your hardy seeds. Onion sets are another thing that will not be damaged if the ground freezes after they have started to grow. And you will need them at the earliest possible time that they can be had. Black seed onions should also be sown at once. This is an expensive crop to raise, and a failure entails a heavy loss. By the following plan I have failed to have a good crop but once in nearly twenty years, and in that case the brown cut worms came on in such numbers as to destroy the entire crop. The land needs to be

very rich to begin with. Now put on say fifteen loads of manure to the acre and plow it in. Put on as much more of fine, well rotted manure after plowing, and harrow it in. I make my beds in lands about two rods wide. After the manure is harrowed in, the alleys and water-ways are so arranged that no water can stand either upon the beds or upon the alleys between them for any length of time. In short, this is one of my invariable rules in all my planting never to plant a piece of land with anything until the drains are so arranged that in case of heavy rains, no surplus water can stand upon the lands or in the alleys between them. I make the alleys two feet wide, as this will allow persons to pass each other, and also allow a man with a wheelbarrow, which we shall find to be an absolute necessity.

This done, the land is all raked by hand, with fine steel-tooth rakes. We are now ready for the seed. The seed drill is set to drop say three seeds to two inches, or three and a half to four pounds of seed per acre. The markers are set to make the spaces between the rows twelve and fourteen inches alternately. In the latter part of June, after you have the weeds well destroyed and the onions in splendid growing condition, you take your hand cultivator, take out all the teeth except the center one, and have that run through the fourteen-inch space as deep as the boy can run it. Another follows with the seed drill, and sows carrot seed at the rate of about two seeds to the inch. By the time these really need the ground in August, the onions are ripe. You top, pull and cure your onions, and take them off the ground; run through the carrots with a horse and cultivator, and they will grow until cold weather and give you a good crop of carrots in addition to a large crop of onions. I have raised many thousands of bushels in this manner. But let us return to our spring planting. By the time the onions are all in, it is probably late enough to risk sowing early beets, carrots, turnips, and some more radishes. These will all bear some frost, but not as much as peas and onions. I prepare the ground for these crops the same as for onions, but make the rows for beets and turnips sixteen inches apart and carrots fourteen inches; parsnips, twenty inches. Celery seed must also be sown at once. This requires care, or failure is certain. Put your bed in the best possible condition, and mark off the rows fourteen inches apart, making them very shallow. The seed must be sown by hand, and very carefully in the shallow marks. After sowing do not cover it, but take a board and lay down upon the rows, and press it down by walking over it. This will cover the seed suffi-

ciently. If the ground gets dry before they sprout, it must be watered by hand.

The asparagus beds must be prepared for the season at the earliest possible moment. Cut off the old tops and burn them; manure heavily, and dig it under with six-tined forks being careful not to dig so deep as to injure the roots of the plants. After digging under the manure, take your rakes and level down the beds and they are ready to begin their season's work, with the first warm day. Last spring in addition to the above I put on after raking, about fifty bushels of unleached wood ashes per acre. The crop was simply enormous. My sons say that we get more food from our asparagus beds per acre than from any other land that we cultivate. I am not sure but they are right. There is a great deal of nonsense in some places about the way and expense of making an asparagus bed. Suppose I tell you in a few words how I make mine, and they are certainly successful. Select a deep rich soil thoroughly drained, put on about all the manure that you can plow under. Plow it deep as you can, and harrow it smooth. Then take your shovel plow, and make furrows say three feet apart from centre to centre. Make them so deep that the crown of your plant will be not less than four nor more than six inches beneath the top of the ground, after the bed is leveled down. Now take good strong roots either one or two years old, not exceeding three years, and place them in the bottom of your furrow. Spread the roots out about in their natural position, putting them about twelve to fifteen inches apart in the furrow. Throw some more manure upon the roots, and fill up the furrows, level off the ground, and your asparagus bed is made. Cut nothing from it the first season, and do nothing to it except to keep down all the weeds and grass. The next and every spring thereafter, follow the directions given in caring for your bed, and it will last your life time, and very likely much longer. You may cut some from it the second season, but not much. The third still more, and afterwards through the entire season for asparagus cutting. Always cut clean, leave no small and worthless stalks to run up to seed, or you will soon damage your bed almost beyond repair.

Well, having the hardy seeds all in, it is time to think about setting out early cabbage, cauliflower and lettuce. I have taken it for granted that you all know how to make hot beds, and that every one who contemplates gardening even upon a small scale, has one or more of them filled with nice plants ready for setting.

I think it is a good rule to plant your hot bed about six weeks before you expect to want to set your plants in the open ground.

I have adopted 28 inches each way as a good distance to set cabbage plants. This allows a horse and cultivator to go through each way. Still as I generally either set a row of lettuce or sow radish seeds between the rows, we generally use only the hand cultivator upon early cabbage. If lettuce is set between the rows put them about twelve inches apart in the row.

I use the Curled Simpson almost exclusively. You may get a crop of either before the cabbage needs the entire ground. Remember always that you must have very rich land to raise large crops of cabbage. No fear of getting it too rich.

The hardy and half hardy seeds and plants being in, the weather being warmer we will plant corn, beans, melons, cucumbers; set tomato, pepper, egg plants, &c.

I have a method of planting melons and cucumbers which I think preferable to starting them in hot beds. Plant them in hills six feet apart each way. First making the hills rich with fine manure. After planting I have a box 6x8 inches on the outside and six inches high, made from a piece of fencing. I put this down on the hill and with a hoe draw the earth around the box and press it down until it will retain its place after the box is drawn out, Make it slope a little to the south. After removing the box, lay on an 8x10 light of glass, and you have in reality a miniature hot bed. The seeds will come up and grow nicely although it may be quite cool outside. After it becomes settled warm weather, take off the glass and put it away for another year; draw the earth back to its place and you have plants two to three weeks more forward than if planted in open ground. In the meantime you may raise a nice crop of radishes or lettuce upon the ground before the vines need the room.

Plant beans in the same manner as peas. Last season I set lettuce between the rows of beans and had a fine crop of it. The beans were all one need ask for. I took them off in time to sow the ground with turnip seed and had an excellent crop of turnips.

But I find that I must hurry along, or I shall surely exhaust my audience whether I do my subject or not. We will now suppose that you have your garden all planted at least once over. It is June, and about strawberry time. You have been very busy all the season thus far, but now comes a season of almost incessant activity which taxes both brain and muscle to its utmost. You have been selling asparagus and a few other things for some time,

but now we are in the midst of the season of green crops. Bunch onions, radishes, lettuce, beets, etc.; peas to pick; strawberries ripening almost or quite by the wagon load each day. Perhaps I cannot do better than to describe one day in my own garden at this season of the year.

We receive our principal mail either about 10 o'clock P. M., or about 6 o'clock A. M. There are orders for from 1,000 to 2,000, and perhaps 2,500 bunches of green stuff, including asparagus, onions, radishes, lettuce, etc.; bushels of peas and strawberries. Most of it is still growing in the garden. The 7 o'clock bell rings and the hands are supposed to be ready to go to work. There are from 75 to 100 of them; perhaps three-fourths of them boys and girls. They are divided into gangs of fifteen to twenty-five each, with a foreman to each crowd. They are started, some to gathering the crops and bringing them in wheelbarrows to the packing house, where another crowd is assorting, cleaning, washing, bunching, tying, packing, and checking off from the order book and directing the different crates to their different destinations. No matter how large the orders are, we have only so many hours to get them all filled and shipped, and each one is put to his or her best to get them off in time. Another train calls for another lot. Before that is put up a boat comes in, and word comes that some one wants so much of this, that and the other, at such an hour for the boat. We perhaps get these all off and ready to do some much-needed work when a telegram comes from some good customer, send me so many cases extra of berries to-night, sure, and such and such of other goods. It is almost an impossibility to get our berries picked for the standing orders. But by making extra exertions we succeed. Teams are put to their best to get to the different depots, boats and customers in time. Night comes and tired and hungry, we gather around our table. The hands have all gone to their homes. A neighbor comes in and says Mamma is going to have some company to-night, and wants so many boxes of nice fresh berries, and so and so of other things. You cannot help feeling annoyed and vexed, but they are good neighbors and kind friends, and so you go back to the garden and get what they want. Well does that end the day? By no means. Your sales are all to copy into the journal, bills to from 15 to 25 different customers to be made out; letters of explanation to be written, &c., and they must all go to the office in time for the mail.

About 9 or 10 o'clock your day's work is done and you are ready to go and rest for a time; get up early in the morning and go

through the same thing again until, when Sunday comes, you will need no exhortations from your clergyman or any one else to induce you to keep from breaking the fourth commandment. If you have done your work systematically and well thus far, you will probably have this one thing to comfort you during these long, weary days. You will be doing something more than paying your expenses, and that is a great encouragement.

At the close of the strawberry season the weeds have doubtless got the start of you in some places, and they must be destroyed at any cost. You must now hurry up the work of getting in your second crops where it is not already done. Set cabbage until the 15th and not later than 20th of July. Set celery up to the 5th of August. Transplant beets and rutabagas up to the same date. Sow purple top flat turnip until 15th of August. This date about closes the planting season unless you wish to grow a crop of winter radishes. If so, sow the Chinese Rose Winter about the 1st of September. They will be nice for winter use.

Marketing crops very often requires as much or more skill than to grow them. In the neighborhood of large cities at the east there is always a market at some price and the demand is so great that the price is not affected by the amount that any one man can produce. Experience alone can tell you how much you can handle profitably of any given crop. My rule in selling is one that I have rarely varied from without a loss. Whenever I can get a fair price for an article let it go, no matter what the prospect of a rise may be.

This rule cannot of course be applied to those perishable articles that must be sold as soon as ready for market. In these cases I adopt the following rule: There is a gradual increase in the demand for certain articles. I know what I sold last season, for instance, of any or all my crops, and wherein I had a surplus or was short of a supply. In planting next spring I shall allow for the increased demand in addition to what I had last season. Suppose I find myself overstocked with some particular article, asparagus, for instance. My own customers in all directions are fully stocked up with it, and to send them more would be simply to entirely break down my own market without doing myself or others any good. I pack it up nicely and carefully and ship it to one of the commission houses in Chicago, and let it be sold there for what it will bring. By so doing, I save my own markets and am rarely obliged to sell for less than cost.

I want to say here that with the adoption of the most systematic

plans of working, and with the best of tools to work with, the profits of gardening are not large, and I can see no prospect of their becoming so in the near future. With a slipshod haphazard method of cultivation and marketing, losses would be inevitable in any market with which I am acquainted. I have thus far taken it for granted that you have what money is necessary to conduct your business. But suppose you have not, what then?

Well, you must commence in a smaller way, work harder, and be more economical than would otherwise be necessary. One can make a beginning with almost nothing, as I know by experience. I have traveled every foot of the road, and although it seemed at times to be not only up hill, but very steep, and the road very rough, and success, if in sight at all, was very far in advance of us. But it came gradually, and came as we trust to stay.

Allow me here to relate a little incident.

Very soon after I had succeeded in getting a span of horses and a market wagon, I was standing upon one of our sidewalks talking with an old gentleman who had known me from my arrival in the State, and knew a little about how hard I had worked to get started. The team was driven near to where we were standing and stopped. He looked them over for a moment, and then turned to me and said, "Well, Smith that is a fine looking team and wagon. Years ago it was hand-basket and wheelbarrows, then a hand-cart, then a one horse rig, now it is a nice two horse establishment. I suppose that next season it will be a four horse concern, and God only knows what will come after that?" I replied, "Perhaps hand-baskets and wheelbarrows again." He replied, "No, there is no danger of your going backwards, you have been too careful, and are still so. You will surely be successful."

Last season I had forty-five acres in garden. Five horses were constantly employed, and one hired team a portion of the time. My market has spread north, south, east and west, and time only can determine its limits.

I mention this not to boast of it, but simply to show that it is possible to succeed with but very little financial means as a basis.

My friends, I have in this hasty manner named some of the things most necessary, in my opinion, to make market gardening a success.

Much more might be said, but I have already made my paper longer than I intended, and hasten to a close. You will see at a glance that it is a laborious business and one requiring constant care. But upon the other hand it is a pleasant and healthful occu-

pation, and one that if rightly followed is almost certain to bring a reasonable share of success, as well as being useful to the community in which you reside. To me there is an unending pleasure in planting the little seeds in the well prepared soil, and then watching them from their first show of life to the final harvest of the crops. As I watch the growing plants the question comes again and again why has the little inanimate seed sprouted any more than a pebble would if put in its place. Yet each as it grows is true to its kind. Watch them as closely as you will and you will never find the tiny celery seed changing to a cabbage, nor the cabbage to a cauliflower.

The beet has not changed to a carrot, nor a parsnip. The tomato will not bring forth a strawberry, nor the strawberry a currant, nor the currant a raspberry, and so on through the entire list; each one, true to the laws of its own being, and true to the laws of the Great Creator who made them and rules over all.

I have said nothing of strawberry cultivation because my views were given here about one year since, and another year's experience has made very little change in them upon that subject.

My friends, I know of no business in which I could, if again a young man, enter into with more zeal and enthusiasm than my present one. It has not made me, nor will it make you a Vanderbilt or a Jay Gould; or a millionaire of any other kind. But it has made me a nice living, a comfortable and happy home, with every prospect of all that we may need in our old age, should wife and myself live to see it. I believe it will do the same for you.

Years hence it may perhaps be said of some of our bonanza farmers in the Northwest, "he has made a very large fortune from the farm, but he has impoverished a whole township of land to do it." Let no such thing be said of you, but rather as they stand around your newly made grave, may they say, "He did his work well. There is one little spot upon the earth that is much better for his having lived upon it. And all about and around it, are the homes of those whom he taught to so cultivate that their places are the better, and more valuable, and their homes the happier because he lived near them."

Col. Stevens. Mr. President, that is the best paper on the subject of market gardening that I ever heard read, and I move that we extend a vote of thanks for it to President Smith, and that he be declared an honorary life member of this society.

Motion unanimously adopted.

Mr. Pepper's prize essay on Seedling Fruits was next called for, and was read by the secretary.

PROPAGATION OF SEEDLING FRUITS.

BY GEORGE P. PEPPER, OF PEWAUKEE, WIS.

Mr. President and Members of the Minnesota Horticultural Society:

Your offer of a prize for an essay on the above subject is presumed to apply only to such fruits as will, withstand the severities of the seasons in the Northwest, and, therefore, I will mention as the first condition the selection of seeds that are grown in this climate, and, for tree fruits, they should be from sorts that are of moderately slow growth; at least, short-jointed and thick-leaved or woolly. The larger the leaf, and, also, the earlier the new wood completes its growth in the fall, the better. To have a hardy variety the leaves must have plenty of time to elaborate the sap, on its downward flow, to harden the new wood and put it in proper condition for the winter. The leaves of late-growing trees drop prematurely, and the sap being in a crude condition, the wood is injured by cold or by sudden changes of heat and cold, in the winter, and the trees are more liable to blight in the ensuing summer. Seeds of such varieties are imperfect, corresponding to the imperfections of the wood. For varieties from which to select the seeds, take either our natural seedlings or the most desirable of the Russian apples. By reproduction, every generation gets more used to our climate, and can be grown further north and west, with success. If the variety should be an early kind, every time it is reproduced it can be grown a degree further north, and be hardy. A summer variety grown a number of degrees that way will get to be a fall variety, and even a winter variety, if so far north as to have only time enough to ripen its wood and fruit. As a rule, the fruit will always be fairer. If any should be grown further south, the fruit is smaller and more subject to rust spots, scales, etc., and to cracking of the skin, especially such varieties as are russety, as witness the Russians. You can multiply any sort by grafting, but it does not make it any hardier. The increasing hardiness manifests itself only through the seed, and, through seedlings, the fruits are extended over larger ranges of latitude,

or we would not have so many varieties in the world. In the natural process of reproduction by seedlings, there is rarely any multiplying of the same varieties, owing to the mixings in the blossoms of different sorts, yet it is possible to make trees produce by their seedlings exactly their like in fruit. Isolation from other sorts of fertilizing pollen of any similar species, at the time when the flower-buds are ready to break open, is all that there is to be guarded against, and any tree that is blossoming in an orchard or garden, where no others of same species are near it, or, at least, so far away that no insects could carry pollen to it, will produce its like in fruit if the seeds are saved and planted; because the pistils will be fertilized from the pollen in the same flower. As an example showing the truth of this statement, I will give the following:

In the early days of Wisconsin settlement I knew of an orchard that was planted with small, one year old apple trees, the land was only cleared that spring; it was in 1843, and there was not room to put them all in orchard rows; so the most of them were planted in a nursery row, about twelve to eighteen inches apart. The land was white oak openings and was quite stumpy. Many of the little trees were destroyed by the plow, and by rabbits, and browsing from cattle, and but few were saved to be old enough to bear; but in the year 1849, one of them had a few dozen apples on, which were the Grey Gilliflower. Mr. Hilliard, the owner, gave me a few specimens of the apples to take home for a treat to wife and children. We saved the seeds. Eleven seeds were planted; eight of them grew; we set the seedlings out when two years old. In 1856, two of them bore apples, and they were the same as the fruit of the parent tree. The next year the old tree hung full of apples, and Mr. Hilliard brought us a dozen more. We planted these seeds also, and one of the trees bore fruit the same year as the first lot (1856,) but these seeds had got pollenized by some other variety, and the apples varied in character, some in shape, some in size, and some in quality. In other words the apples from trees grown from the seeds of 1849, were all alike; from 1850, all different. There was no other tree in bloom in the vicinity of the Grey Gilliflower, when its crop of 1849 was set; but the next year, three or four of the adjacent trees of other sorts had come into blossoming, though they did not bear fruit, and their blossoms had pollenized those of the Grey Gilliflower, and the mixed and changed character of the progeny from seeds of that year was the

result of it, not one of that planting is like the mother tree, while all of the first planting are exact reproductions.

This proves that blossoms self-pollenized, or fertilized from pollen of same variety, and tree will produce their like, and that varieties come from cross-breeding.

But if other varieties are wanted to improve them or make them longer keepers, or change them in color or size, there must be an understanding about the blossoms, because most of them have stamens and pistils on the same flower and as has been already stated will reproduce themselves if alone. Therefore it is necessary to understand which are the male and also the female organs, and find which predominates, and what influence the male or female has on the fruit, seed or stock, or constitution and hardiness of tree. If we do understand it, we can almost to a certainty raise or make any desired improvement, either in fruit, or tree, or both.

Now to raise a seed or seeds that will make a hardy tree, and at the same time improve the variety and be a good bearer, we must select for the female the hardiest and the best form of the tree, and form of fruit, and for the male, the earliness or lateness, quality of flavor and productiveness. For culture in fruit where stamens and pistils are in one blossom, and we have an early variety that is perfectly hardy and we wish to improve it and make it a late keeper, we must select for the female the tree that is the strongest and hardiest of the two varieties we like to improve, and when it is just commencing to blossom, cut off or remove the stamens below the pollen sacks or antlers just before the flower leaves or petals are opening in the morning, upon a spur or an upright limb or branch that is at an angle so the spur with a bunch of flower buds can be covered with something that will protect it against other pollen falling upon it, or brought by bees or insects of any kind. A small glass bottle or jar, such as a quinine bottle or something of that kind, will do. Now get a spur or bunch of blossoms that you want to use for the male—if already opened, all the better; but if the trees are quite a distance apart, best use two bottles; and put the second one on the spur before you remove it in order to save all the pollen, then go to the first tree you had protected, and change the bottles at once; put this second one (that is the one from the tree used for the male or fertilizing side of the operation) over the spur where the pollen had been removed, cover the mouth with something to keep it closed, and as soon as the sun dries up the dew, and warms the air, the pollen

will be ready, and then, by jarring or shaking the limb, the pollen will be seen flying all over inside, and the fertilizing is done.

Now, here lies the mystery: Which variety does control or influence the new growing seed? It will be observed that the fine dust of the pollen had settled on the tips of the pistils or stigma, which had a little shiny liquid on the tips, which, adhering to the pollen, dried it up, and the seed now forming, of which each has a stigma or open tube that reaches from the pistil to the forming seed in the core, ripens and contains the mixture of both varieties. If all the pistils are equally supplied with pollen, all the trees raised from these seeds would bear fruit alike, but as that is not often the case, each individual seed will have the predominance of either parent in a greater or lesser degree accordingly as they were fertilized. An apple blossom has generally five pistils. Each of them has from two to five stigmas, according to the propensity or vigor of the tree. Each stigma is formed from an embryo seed, and if fertilized will produce a live seed or germ. A germ has in itself the power to expand and grow and reproduce again. Each seed is an independent individual, and capable of varying from every other one. Therefore it is necessary to guard against having the blossoms exposed when they are opening if you want to improve the variety by this process. As to varieties to work with, I should use the Duchess or Tetofsky, or any of our Minnesota seedlings that are hardy for the seed raising, and use Wallbridge, Utter, or any next hardy sort of good quality for the sort to pollenize with; or if hybrids are wanted, take the hardiest of the crabs for the female and any of the other named apples for the male. In this way an abundance of home-grown apples can be raised. All there is required is time and a careful hand to do the fertilizing.

QUALITY OF APPLES.

If we inquire at any commission house in Chicago or Milwaukee for the best table or dessert apple, they invariably will say we have Spitzenberg or Baldwins, if they get their supply from New York state.

Now the Spitzenberg, it is true, has the highest flavor, and the Baldwin a little of the same, but the flesh is hard and tough and indigestible. It is a mistake to call them dessert apples, as they are lacking in juiciness and dissolving properties. In my estimation, Jonathan, Wealthy, Northern Spy and Fameuse, are now quite equal to the Spitzenberg in flavor, but how far superior they

are as dessert varieties any one familiar with them well knows. The reason of their superiority lies in their crisp flesh, which is yet so tender as almost to dissolve in the mouth. The more we get acquainted with the Wealthy the more we value it. I might mention the Pewaukee, but the flesh is coarser and is more for culinary use. For pollenizing in cross breeding these varieties would be preferable as named in their order; also Rawle's Janet or Westfield Seeknofurther could be used, if none of the others could be had. A few scions of such, grafted on some hardy standard or seedling kinds, would soon give the blossoms to work with.

For planting trees for cross breeding by distribution of pollen by wind and insects, little arrangement is necessary, as it is known that pollen will fly, or be carried a long way and from any blossom that is just on the point of opening.

If any had already been open on the same tree or others in the same orchard, the pistils are just as likely to be fertilized from a variety forty rods, or even eighty rods off, as one close by or even from the same limb. Most buds throw out, from two to five, or more flowers or spikes, but do not all open at the same time and work naturally like sprouts on a potato, however, it would be well to set, perhaps, rows alternately with such trees as are selected for the mother or for the fruit, the seeds to be saved for replanting. If the wind should be from one side of the orchard for two or three days, when they are in bloom the pistils on that side of the rows would mostly be fertilized from the neighboring pollen from that direction, except where insects carry the pollen against the wind. The only practical way to make sure of getting anything like the varieties wanted, would be to try hand work, either on a small scale as described, or by having the variety selected for the mother, surrounded by the different varieties to be used as walls, and have a canvas tent to cover the first two trees, one year. The next year with the other, etc., so in four years, the same tree can be fertilized four times, and have all the fruit take only after the two varieties inclosed the same year. A tent could be used over the mother tree and cut branches, full of blossoms and inclose in the tent. Of course the tents have to remain until the petals and pistils dry or wilt. In this way a good share would be just what we would expect.

Always save the seed of the early variety, if that was the one that was hardiest and the best tree, if you want the new fruit to be of tree, male and a keeper. On the contrary, if you want early, save the seed from the opposite.

To plant the seeds for new varieties, prepare your soil the same as

if you planted trees from a nursery. Stake out the ground and work the spot deep. The larger the hole and deeper the subsoil, from the surface, the harder you have to pack the soil, when you fill it up again. Set the stake, then plant two or three seeds on the north side of the stake, or anything else you are using for a mark. If they are fresh plant them in the fall and cover about one inch with loose earth or mould. If dry, plant early in spring soaking the seeds first, and cover lightly, say half or three-eighths of an inch deep. Keep clean, the same as your corn, potatoes or any hoed crops. If all the seeds should come up, remove the surplus either the first or second year.

To enlarge the orchard, transplant them, or fill out where any are missing ; taking good care in digging them up to save all the roots possible. Unless you do so, those not disturbed will get the start of the transplanted ones. Mulch the first winter if on an exposed situation. Do so any way, so as to be sure the frost will not go below the tap roots. The only success we will have in raising good orchards will be by planting seedlings one year, or the farthest, two years old.

Transplanting should be done thus early because the main tap root is not disturbed. The further the soil is loosened the faster and farther these roots will go down, and the safer the tree will be.

The roots will not be killed because parts of them reach below frost, and if it should freeze up dry in the fall, those roots will supply moisture, when the frost is coming out of the frozen part, even if the earth takes it up.

The small trees should be watered if not mulched because the tap root may not go far enough to be safe from frost.

Drouths are no injury to deep rooted trees. I am convinced pears of hardy kinds can be grown in the same way, because the farther the tap roots go down the lesser will be the surface root, and certain changes in the weather will not excite the trees, and stimulate to excessive growth, and thus they are saved against fire-blight.

We have samples from a pear tree that stands on level ground. The seed was planted where it stands in 1858. It got broken down in 1865 by a team running away, but it sprouted up again and there is now a clump of five or six trees from four to seven inches each in diameter. One of those is very curved at the ground, and the roots have grown out on the underside of it so much, that the part where the shoots had started out, remained only the size of an inch or so, because those surface roots supplied the tree as fast as

the leaves wanted the sap. Consequently, the tree had no tap root for a supply. The hard winter two years ago killed this one, but the others seem to be all right, as those that made no surface roots were below the frost, and we had a good crop last year and this. It is not a very good plan, but the tree is hardy and the fruit keeps well.

If the seedlings should be raised in a small patch by themselves, they should be well taken care of and set out in the orchard the second year, with all the roots that can be saved on taking them up, especially the center or tap roots. If they should be wanted to graft new varieties (say the hardy winter Russian, if we ever get such) there would be a little time gained, either in grafting before planting out, or any time afterwards.

To take care of such an orchard and have it do well, it should be located on high or naturally drained clay or limestone soils and sloping to the east or northeast.

The cultivation should not stimulate overgrowth, and the laterals, or side branches, should be pinched in occasionally to form a good head. When three to four or five years old, if the trees show no blossoms, tie a wire around one of the lower branches, or girdle one, to make it sick. Do this in June or July, and the branch will get filled with blossom, buds, and bear the next year. Always leave the lower branches to protect the trunk of the tree. Shorten in and only remove them gradually, as the limbs you are training to form the head of the tree, expand to shade the body.

Some will say this is rather a small business, to start an orchard in this vast northwestern country. We acknowledge it is rather a small beginning, but should the amateur be patient, persevering and industrious, and can estimate the value of small things, above all have a love for his business, he will not fail of his due reward. Other crops may be raised between the rows. These may be either of small fruits, such as currants, strawberries, or any other crop that will not interfere with the growth of the trees. Only a short time of patient industry, and the seedling orchard will produce its fruit.

At the conclusion of the reading of Mr. Pepper's essay, the president appointed as a committee of award on the prize essays, Messrs. Stevens, Elliot and Mendenhall, and the essays were then on motion referred to said committee to read them and award the premiums, notice of their award to be furnished the secretary, and the committee was authorized to approve for publication or revise therefor any that in their judgment may be found worthy.

DISCUSSION OF THE ESSAY.

Mr. Peffer. Thick-leaved varieties make short growth of top and much root. Prefers these varieties for stocks, for when such trees freeze down they have enough vitality in the roots to rebuild on. Pears can be raised by planting seed of hardy varieties in the place where they are wanted to stand. In answer to an inquiry, says a friend of his lost all of his trees but Tetofsky at 53° below zero. Transcendent stood at 50°, but went at 52°. Trees were in a valley. Duchess and Fameuse killed at 45°. These trees were all two and three years old and had no tap roots. Otherwise they might have recovered.

Mr. Phillips. I knew a man to cut off the tap roots of an entire young orchard and move it to another place. But his trees never amounted to much afterwards.

Mr. Peffer. I have twenty-five pear trees planted in 1857. These trees are good; tap roots of some can reach the water. Some are only six feet above water, while others go down eleven feet. I think it is owing to the tap roots going to water that the trees have stood so long. Have one seedling as good in every respect as Flemish Beauty. Pears might succeed grafted on crab if put low enough to take root from the scion.

The Secretary. Last fall I read in a York State agricultural paper that there is one variety of the pear that top-works well on the apple. This is the Seckel—that little, delicious honey sweet pear of the eastern markets. Chase Brothers, of Rochester, N. Y., have kindly sent me some Seckel scions for trial, and in the spring I will put them on the Whitney No. 20 and report what they do for me. I have furnished our West Salem friend Phillips a few of same for trial in his orchard.

Mr. Sias. It is best to let roots go deep. Think have I never dug holes deep enough. I had a man last fall to dig holes for me. He put them down four feet. He was a German, and had seen trees in the old country 100 to 150 years old, and bearing crops of 50 bushels to the tree.

Mr. Peffer says he knew of a man in the old country who sold earth to make roads of, and had trenches dug ten or twelve feet deep and filled with rubbish from the cities and then planted trees on top.

Miss Share's paper was read by Assistant Secretary Stearns:

A DISCURSIVE PAPER CONTAINING SOME FACTS.

BY HORTENSE SHARE, OF ROSEMOUNT, MINN.

In this paper I propose to give a part of my experience in trying to surround a home on the prairie with hardy shrubs, flowers, etc.

We who have fought this climate (that's the word) for twenty years, have had many failures and a measure of success, just enough to stimulate to continued effort. As in every failure may lie the germ of success, we keep on trying.

Very few women on farms, with the stress of work incident to such a life, have much time to devote to flower culture or ornamental gardening. Yet nearly all want and need some beauty to refresh the eye and rest the overtasked body in the few breathing places allowed them in their weary routine.

Many can find time and desire to plant a few shrubs and bushes, provided they are hardy, requiring no shelter or fuss of covering for winter.

The Lilac, Viburnum or Snow-ball, Syringa, Tartarean Honey-suckles, Scotch Roses, pink and white, single and double Yellow Roses, have proved entirely hardy. The Maiden's Blush needs a slight protection, blooming without the buds blighting as is common in States east of the Mississippi.

A rose I brought from Ohio is hardy—name unknown. There it was a damask red in color; here it is a bright rose pink. Sprouts around as things are given to in this soil; each spring it gives us a profusion of large loose double roses of exquisite fragrance.

We found planted in the yard, two slender stems of lilac, switching helplessly in the strong winds. These were allowed to sprout as much as they pleased, up to a certain point. Now, we have five large clumps, whose thick stems and close branches defy the winds, and are great nesting-places for the birds.

The largest of these bushes measures now, (Nov. 24,) without foliage, 35 feet (thirty five) in circumference, and 11 feet in height; the others being nearly as large. The bloom was regal this last spring, equal to any I ever saw elsewhere. I felt like making

them a courtesy each time I passed. As Prof. Gates said of a yellow rose in superb bloom in his yard—"Why, Miss S., I take off my hat to that rose every morning!" We have a Rose Acacia bought of Mr. Ford, the third day after we came to Minnesota in 1863, the roots of which are bound to live. Each spring new sprouts come up and bloom profusely; some of these live through the winter, others die; all the same other sprouts start, grow and bloom. In Ohio I have seen the Acacia the size of a large peach tree. I have a profound respect for that Pink Locust, it does the best it can under the circumstances; if it cannot be a tree, it's bound to be a shrub!

The large blue, and the small purple Easter Iris, yellow and blue and white flags, yellow and brown day lilies, are all hardy; purple or blue Tecmorocallis and Tiger lily also. The last is a nuisance, each tiny seed-bulblet sprouting where it falls.

The old-fashioned Live-for-ever grows in immense bunches and has large heads of bloom.

Could we grow nothing else than the shrubs, vines and flowers, indigenous to Minnesota, we might have lovely, tasteful yards. I quite agree with Mrs. Van Cleve, that very many are worthy of cultivation. The snow-berry, spirea, tree-cranberry, red alder, indigo shrub, June berry and many others are worth transplanting. A June berry bush in our yard is the admiration of all who see it; it is twenty-five feet in circumference and sixteen feet high, symmetrical as a lombardy poplar without its stiffness. It is beautiful when in bloom, and the berries are good, if the birds allowed us any. This shrub would make a beautiful hedge between the house yard and garden. The choke cherry is pretty enough to adorn any yard, with its glossy leaves, long spikes of fragrant white blossoms, and abundant fruit; this, the birds take—scolding as if we were the intruders. The Bitter-Sweet and ampelopsis I have growing freely. Baskets of spring-beauties, anemones, penstemons, columbine, moccasins, phlox, &c., &c., I have dug up and lugged home, one time or another. Lily roots, too, for which you had to dig down *for-ever'n-ever*—especially if you had gone into the brush with only a knife, and found such lovely lilies you just couldn't leave them! All these make a pretty "wild garden" if one has time and inclination.

Ferns and Maiden-hair are abundant. I have walked through the bracken higher than my head. These carefully taken up, with all the earth that will adhere, and planted in a cool, shady place where they will not have the afternoon sun, grow readily. The

handsomest border of ferns I ever saw was in Lebanon, Ohio, in the yard of an old schoolmate and dear friend—Mrs. Edward Weakley. They were planted just inside a tasteful iron fence, and shaded by a row of large trees on the outer edge of the sidewalk, and never had the afternoon sun. The plummy fronds (of many kinds and shades of green) were higher than the fence, gracefully curling in and through its openings. It was a hot afternoon—they gave such an impression of delicious coolness and shade, lush abandon of growth—the impression will always remain. No border of flowering plants, however gay, could have excelled their dainty beauty.

Wish I had known sooner the Catalpa was hardy here. Twice in Ohio have grown them from seed, which germinate easily and the plants are of rapid growth. Mine were planted in a garden border without any particular care, growing from two to four feet the first year. Some were transplanted the second, others the third year. In a few years they made large trees bearing immense clusters of crape-like flowers, white with brown markings. There are two varieties of Catalpa, one having long, slender seed-pods, and smaller clusters of flowers, and slow growth.

The variety I planted has long, large seed-pods like the old Miss Creeper. I brought seed with me, but did not plant it; being told it would not live here no more than the alanthus; some trees of which we planted; the roots of which actually survived one winter, sprouting out in the spring. Am much interested in the accounts of the Russian mulberry. Could not some seed be procured for distribution by the society? Or where can it be obtained? Several times we have grown the wild, black mulberry from seed; the little trees begin to bear the third year; it is a delicious fruit.

Many persons will not take the trouble to grow trees from seed, because they may not live to eat the fruit or reap any benefit. How selfish. My dear mother was very fond of having a fine garden, and planting tree seeds; never ate a good peach or plum without throwing the pit where it would come up. We always had a border in the garden full of nice, thrifty peach trees to transplant, having every year bushels of this luscious fruit. Some one sent her three or four large Orange Quinces; she admired them very much, saying, "I must plant the seeds of this big one." She was then over seventy years. "Why, mother, you will never see any quinces on trees from that seed." "What of that," she quietly replied, "you or some one else may." So one day that fall I made the trench for her in the garden, and she dropped in the seeds.

In the spring five came up, grew slowly, but were thrifty. The next spring they were set out in the yard; ground around them kept free from grass, and often stirred. The quince is proverbial for slow growth, but those little trees bloomed the third year, and the fourth year the largest bush bore five quinces! One afternoon I went to town, and on my return mother showed me her large China bowl full of preserved quinces, clear as amber, and delicious, saying, "You and L. said I would never see any fruit from that seed. Here are preserves from them you both would like to eat."

Boys and girls on farms should be encouraged to plant tree seeds of all kinds known to succeed here. I shall never get over the longing for the fruit and the nut-bearing trees in my old home.

Are the winters getting more moderate? Along the roads the dog-fennel is rampant. Old Father Finlay (of blessed memory) used to say, "Methodism and dog-fennel were bound to take the West!" Don't know about the first, but the last is under full headway. It is not six years since it began to disfigure our fine roads. How I hoped at first the winters would kill the vitality of the seeds; not a bit of it! Along the fences now are seen the familiar herbs, catnip, hoarhound, and in some places even the mullein. I scattered pennyroyal under the trees in the yard, and now it abounds every summer. *Is* the climate getting more moderate? Am afraid not. The weather is a gay deceiver. What can surpass our lovely Junes, which are beautiful enough to deceive the very elect! And this autumn weather! We enjoy it in fear and trembling, for old winter may swoop down fiercely any day, freezing us to the marrow.

HORTENSE SHARE.

November 24, 1882.

President Smith. I am glad to learn that you have ladies assisting in the meetings of your society. In Wisconsin our societies have no meetings without papers or essays by them. We claim the best corps of lady writers on Horticulture and home topics of any State in the west, but would like to have your Minnesota ladies compete with them.

QUESTION BOX.

Has any one raised the Russian mulberry in Minnesota? If so, with what success?

Mr. Woolsey. It has not succeeded on our grounds.

Mr. Pearce. I went with Col. Stevens to Mountain Lake, Cottonwood county, to see the Russian Mulberry. The place is peopled by the Mennonites, from Russia. They grow the mulberry for food for silk worms. Plant out in rows from seeds and cuttings, and cut down every two years, and feed to the worms. They are hardy. I arranged for 20,000 cuttings. Had notice published that I had them. I got them last spring. Some grew and others did not. I have some two feet high or more. Do not regard it as a forest tree, but as an ornamental tree it will be valuable. Fruit is good. I have a few cuttings saved last fall that I shall put out and think they will grow.

Mr. Underwood. The cuttings should be started in hot bed or cold frame. Have grown them extensively and successfully in this way, but would not risk them in open fields. Have been most successful when the cuttings were taken in the fall. Think they are as hardy as those started in the field—probably more so, because more vigorous. Have grown plants three feet high and well limbed this year.

Mr. Pearce. The cuttings should be, when planted, of the last season's growth. Older cuttings do not do so well. They can be made to grow by proper care in open ground.

Mr. Poole. Jameson currant cuttings if placed in the ground as soon as soon as the leaves fall, will root the same season.

Mr. Underwood. I presume mulberry cuttings would do the same.

The committee on recommendations of President's address and Secretary's report, reported as follows:

Your committee on the President's address and Secretary's report, would respectfully submit and recommend the following suggestions therein contained:

1st. That a standing committee of five be elected on seedling fruits and that the Professor of Agriculture be chairman of

said committee. Their duties shall be to establish at least five experimental stations in the State for the testing of new varieties, and to procure scions seeds and plants of such varieties as may appear desirable and distribute them for trial. The list shall embrace apple and crab, and may include any other variety of fruit, flower, shrub or vegetable. It shall be the further duty of the committee to note carefully the result of all experiments made and to prepare a report for the annual meeting of our society.

2d. That we accept the offer made by the agricultural department of our State University for establishing an experimental and seedling orchard in the interest of our society, also the provisions they so kindly offer us of a permanent home, and would recommend the appointment of a librarian.

3d. We recommend to the executive committee the appointment of Prof. Edward D. Porter, as delegate to the American Pomological Society at Philadelphia in September next, and that he have charge of making an exhibition of the fruits of Minnesota at that time. Also that the executive committee make the necessary provision for defraying the expenses, either from our treasury, or a special appropriation from our State Legislature.

4th. That the employment of an entomologist, and the publication in our transactions of a brief practical paper on insects injurious to fruits and vegetables, be referred to the executive committee, with power to act.

5th. That the subject of a catalogue of our fruit be referred to the committee on seedlings and that they be requested to prepare a list of fruit with a brief description of season, quality, &c.

6th. That the secretary shall place in the library of the society 500 copies of the bound volumes of the transactions of each year, to preserve for future use. That the balance be distributed, first in compliance with the law to the legislature, to county societies and to corresponding bodies and persons, and to life and annual members, and secondly, the balance to be distributed to members and reliable men through the State, who shall give them away to those who will be likely to be most benefited by them.

G. W. FULLER,
J. M. UNDERWOOD,
WM. McHENRY.

The report was taken up by sections and the 1st, 2d, 3d and 4th sections adopted without debate.

The question being on the adoption of section 5, Mr. Underwood said the catalogue contemplated was to be more elaborate than

the ordinary list we recommend for cultivation, and is mainly to be a description of our fruits.

Mr. Mendenhall. Such a catalogue would be useful and very convenient, but involves much labor.

Secretary Gibbs. It is desirable that we have a catalogue of all the domestic fruits grown in the State, with proper descriptions showing style of plant, shrub, tree and fruit, so that we may identify our fruit by it. It is not necessary, in my opinion, to consider the question of hardiness or adaptation, as we have another and a restricted list for that, which will come into our report for the new districts or fruit belts designated this morning under my resolution as amended by Prof. Porter. In the Michigan reports will be found a model catalogue of this kind, prepared by President T. T. Lyon, and I think it will be found on examination that the most of our fruits are described in that catalogue. The exceptions will be only a few of our Minnesota seedlings, crabs, and perhaps a few fruits not grown in Michigan. Hence the labor of making the catalogue will not be so very tedious.

Mr. Underwood. I am in favor of a complete catalogue, alphabetically arranged, and not allow the committee to consider the question of hardiness.

Mr. Cutler. Such a list might be valuable to nurserymen, but not to the general public.

Mr. Underwood. Nurserymen do not need any list to sell by. I would rather have one live agent to sell stock than all the lists in Christendom. We do not advocate this list as nurserymen, but as pomologists,—a catalogue to turn to for information as a dictionary of fruits.

The Secretary. Suppose you have an apple or a strawberry growing on your place and want to satisfy yourself whether it is true to name, or, if you have no name for it, you want to find the one that belongs to it. You take down your Horticultural Report and examine the fruit catalogue, and there you find out. It will benefit the farmer more than the nurseryman, as the latter generally know the varieties they handle, and farmers are oftener puzzled to know what sorts they have got.

Mr. Fuller. I differ with Mr. Underwood, and do not believe in publishing lists containing varieties not generally successful. It would tend to mislead the people, and enable eastern dealers to sell varieties not adapted to the climate; would make the list small and true—true to name and true to State.

Secretary Gibbs. If we recommend nothing in this catalogue,

but only use it as a fruit dictionary, and for our recommendations make up another list, and a smaller one according to adaptation to our fruit belts, I do not see how we are going to mislead anybody.

Mr. Pearce. If descriptions are true they will not mislead.

Mr. Gould. I think such a catalogue will be valuable.

Mr. Eldridge. That is my opinion too.

The Secretary. In order to embody what appears to be the majority view as to this catalogue, I offer the following, and move its adoption as a substitute for section 5 of the committee's report,—That the committee on seedling fruits be requested to prepare and furnish to the secretary, before our next annual meeting, a descriptive catalogue of all the domestic fruits grown in Minnesota and already known by name, and that there shall be added to such catalogue, from time to time, all such new seedling fruits as may be named by this society and recommended for trial.

Which motion was adopted.

The sixth section was concurred in, and the report as amended was then, on motion, agreed to.

The finance committee reported the treasurer's account correct according to his books and vouchers, and recommended that the balance of \$25.33, due the secretary, be paid.

Report of finance committee, on motion, was adopted.

The committee appointed to confer with Amber Cane Association, recommended that the society meet with that association in joint convention to-morrow evening, to listen to addresses of Mr. Geo. Greer and Prof. Weber on the amber cane sugar enterprise at Champaign, Illinois.

Report adopted.

EVENING SESSION.

SECOND DAY.

The president appointed Prof. Edward D. Porter, Wyman Elliot and James Bowen as a committee of judges on exhibitions.

Wyman Elliot. I would ask to be excused, as I am an exhibitor in the potato department.

The President. No excuses, Mr. Elliot. You can retire when you come to that. This committee did some good work at the state fair, and we want more of it, as we have a large and fine exhibition of fruit and vegetables, and want experts to judge it.

The following reports from general fruit committee were then read :

FRUIT REPORT FROM MOWER COUNTY.

AUSTIN, MOWER COUNTY, MINNESOTA, }
January 5, 1883. }

I cannot report much success in fruit growing in this section of the State the past year. Apples promised well early in the season, but late spring frosts destroyed almost the entire crop. Some few of the crab species were brought to market, but none of the standard sorts. During the two years previous, our market has been well supplied with the Duchess; price as low as \$1.00 per bushel.

Mr. Ellis, a prosperous farmer living one mile east of this city, has an orchard of thirteen acres planted mostly in '72-'74. Says he has lost more of the crab species by winter killing than of any other. His standard sorts—Wealthy, Tetofsky, Duchess, etc.,—are among evergreens, the latter very largely shading the ground. His trees look healthy, stems straight, tops gracefully formed, limbs slender but full of fruit buds. May not thier non-bearing be due to the fact of the evergreens having exhausted the soil?

Other orchards in this vicinity, of small size, bore the last season a very few apples.

Of grapes, there were none that ripened for market; frost took them all.

A few raspberries. I saw about one-fourth acre of some black variety—could not learn what—said to have yielded thirty bushels. This patch was surrounded by a willow hedge, and very heavily mulched with straw; whole ground covered so that not a weed could be seen. They were in hills; canes suffered to grow six or eight feet in length.

Mr. Galloway had last year 144 rods of land in strawberry plants; had cultivated and mulched in years past, but had never obtained a fair crop. Last year omitted mulching, and they were very weedy. Early in the spring he scattered straw, and burnt over the whole piece so that there was hardly a sign of a plant. But in the course of two weeks they began to show life, and grew rapidly. I should have stated that the burning was done soon after rain. His yield was 2,500 quarts.

I have two acres of old strawberry plants, mowed down directly after the picking was over; old mulching and weeds left for winter protection, all of which I design to burn over in the spring. Have tried bagasse for mulching, and succeeded with it better than with any thing else I have used.

Yours Respectfully,

A. MORSE.

The Secretary. Early bearing is sometimes a sign of weakness in the tree, and late or moderately late bearing, of strength and vigor. Probably the present unfruitfulness of the young orchard mentioned by Mr. Morse may be thus explained. Young evergreens are not supposed to sap much vitality from the soil, and if not too thick or too high to shut out the air and the sunlight from the trees, would hardly prevent fertility when the fruit trees are old enough for healthy trees to bear. Their present good condition is quite likely due to their evergreen protection.

FRUIT REPORT FROM WINONA COUNTY.

MOUNTAIN HOME, }
STOCKTON, WINONA COUNTY, MINN. }

As I cannot be with you at the Winter meeting, I will try and send a few items of what I am doing in the way of "trying," as this seems to be our mission here, whether we are raising fruits and flowers or delving in the mines.

I cannot boast of many acres in fruit yet, but I have fruited enough this year to encourage me to still further efforts. My location is on the highlands, $1\frac{1}{2}$ miles northwest of Stockton Village, overlooking the valleys and dales for miles away, including our fair sister Wisconsin's friendly shores. My land slopes to the north, northeast, east and southeast, lying in a crescent shape. I am not troubled with late frosts in spring or early frosts in fall. Soil is rather heavy clay loam once covered with white and black oak timber. I consider all such locations better than valley or prairie. Apples raised here keep several weeks longer without rotting than those raised in valleys below. I have fruited this last year the Orange, Minnesota, Hislop, Transcendent, Yellow, Burns, Fisher's Favorite, three seedling crabs, Duchess, Tetofsky, Price's Sweet, Fameuse, Haas, Plumb's Cider, Wealthy and several other kinds. The names I am not certain of, as my records were burnt last winter when my dwelling burnt. Also red, white and black currants, Philadelphia, and a seedling black cap raspberry of promise, Snyder blackberry and some thirteen kinds of strawberries. I think the most of the Capt. Jack for profit. Also Concord and Janesville grapes and some seedlings of Janesville, and seedling cherry and apple. I have several seedling apple trees that will blossom in coming spring, I think. The trees are pictures of health and I hope may be good fruit. The one that fruited was shown at the last State fair, and is keeping good, but some specimens are water-cored. The flavor is good, and similar to that of the pear.

Of other seedling trees near me, I would mention those of Mr. D. Q. Burley of Minnesota City, Minn., as having borne some excellent sorts, and some, I think, will prove good. Mr. Burley, while serving his country in the seventh Minnesota Regiment, brought home some apple seeds from Alabama and planted them. They fruited for the first time this last summer and were good for first year's fruit, as I find that a seedling improves in size and quality up to the third year of fruiting. Apples were a fair crop in all the old orchards.

Mr. Whetstone, of Minnesota City, had some 600 bushels, (this was formerly the Mrs. Campbell orchard). My Flemish Beauty

pear trees look good. For future planting I shall use largely of the Wealthy with fair sprinkling of Fameuse and other good sorts as they shall appear.

Am trying seeds of Wealthy and others, and we may yet find the coming long keeper, for general planting.

Hoping you may have a good time, I remain

Fraternally Yours,

W. K. BATES.

FRUIT REPORT FROM WABASHA COUNTY.

MILLVILLE, WABASHA CO., MINN., }
December 28th, 1882. }

We have an abundant crop of fruit of all kinds to report from our highlands this year. Hardys and semi-hardys and all the tender kinds having life left in them, blossomed out all over and along the summits of the river bluffs, and generally on the highlands, the apple trees carried a very full crop of fruit to maturity.

In the valleys the frost of May 23 was destructive and little fruit great or small was raised. The Wealthy is said to have shown a greater hardiness in blossom to resist a severe frost like that than any other sort.

I will not go over the ground as to each variety fruiting this year, but will say that the Early Richmond cherry trees on my place are sound and thrifty and bore this year abundantly. They were planted before the winter of 1873 and have borne me good crops for several years. I am out on the prairie openings twenty miles back from the Mississippi river.

And as to pears I am informed that the Flemish Beauties, two trees of eight or ten years of age, in the garden of Wm. Dustin at Reed's Landing, heretofore reported on by Mr. Gibbs, are in flourishing condition, showing no blight at present, and that they bore four bushels of perfect fruit this year. They are on a steep side hill facing the north, and about three hundred above the level of the Mississippi, which at this place, mouth of Lake Pepin and junction with the Chippewa river, never freeze.

I will give you my experience with Duchess and Wealthy. Have not far from forty Duchess in bearing, planted at different times in sixteen years. Of all my planting of this variety, say ninety-five per cent. are in thrifty condition. Since they commenced bearing freely I have never failed in any year to have plenty of them.

I have about sixty Wealthys in bearing; have not been as fortunate with this sort of my planting of Wealthy, ranging through a period seven or eight years, only about sixty per cent. are sound, yet candor compels me to say my losses mostly occurred in a corner of the orchard where the surface water settled and froze in the winter, and on the whole I consider this a profitable variety. My crop of Wealthys the past season on these young trees was something over thirty bushels. It is safe to say that in my neighborhood the Wealthy is doing well in good location and under good care. I think it is inclined to overbear when young and needs looking to and the fruit thinned out. I will say a good word for the Tetofsky also. It is a success with me, and were I to replant my orchard or begin a new one, I should set about as follows:

Tetofsky 25 per cent., Duchess 25 per cent., Wealthy 50 per cent., and no other variety of the apple kind except for experimental purpose.

Yours, Very Respectfully,

C. L. PRATT.

Mr. Gould. I will report verbally for the Lake Minnetonka district. Our fruit crop has been a success the past year. Quantity larger and quality improved. Prices advancing. Frost did a little damage, and but a little. The grape crop is receiving more attention and prices are advancing. Our section seems adopted to high quality and productiveness of the grape, and we get the highest market price. Our Delawares are in demand as far away as in the Chicago market. Strawberry and raspberry crops are not as much of a success, probably owing to lack of snow in winter.

The Secretary. In my travels last fall through the lake shore grape region in Ohio, Pennsylvania and New York, I took particular notice of the grape crop, and nowhere did I see such fine Concords and Delawares as in Minnesota and northern Wisconsin. On my return home I visited the vineyard of our ex-President Truman M. Smith, at St. Paul, and saw him taking down clusters of Delawares from his vines that would be worthy of a first premium anywhere; and Mr. Gould, Mr. Latham and Mr. Eldridge at Excelsior showed me samples they were taking to market that would adorn any fair. It must be in grapes, as in apples and crabs, that our soil and climate are particularly favorable for external finish and bloom, as well as quality of the fruit for eating. As to apples, let us add—and we can get it—"a little more personal strength" to the tree, and we can beat the world on fruit raising.

FRUIT REPORT FOR THE ROCHESTER DISTRICT.

The crop of winter fruit for 1882, was the largest ever grown in this district. And the only serious drawback to its success, as far as I could learn, was the ravages of the codling moth. This pest was very troublesome in many parts of the district, and in my own orchard it caused from one-half to two-thirds of all my fruit to fall before maturity.

The severe frost the latter part of May that wiped out the greater part of our summer fruits, did but little, if any injury, to our winter varieties.

NEW VARIETIES.

We fruited 45 varieties of the so-called Russians. From the Duchess we gathered perhaps one-third of a fair average crop, while from the other 44 varieties we probably did not get over ten bushels of fruit.

Robert Waldron has some of the finest new seedling apples in this district. Seedlings from the Fameuse that show a marked resemblance to that well-known variety.

We have a seedling sweet apple that may possibly prove equal in quality to the Price's Sweet, with tree much hardier.

Sidney Corp, of Hammond, exhibited at our State Fair a plate of the largest and finest Duchess of Oldenburgs ever grown in this region of country, one measuring about twelve and a half inches in circumference.

Article 10th of our Constitution makes it the duty of the General Fruit Committee to report annually a limited list of fruits best adapted to general cultivation in the State at large. In response to this duty I will name the following: Wealthy, Rollins Pippin, Duchess and Elgin Beauty. We doubtless have several other new seedlings that will prove as good as those named, on further trial.

The Pippin is rather late in coming into bearing; we have not fully tested its bearing qualities, but as far as its being hardy is concerned, we are well satisfied, and there is no winter fruit grown in the State that suits our taste better. Would not advise planting it extensively till we know more of its bearing qualities.

Pears have received but little attention in this vicinity; the Flemish Beauty being the only sort cultivated here, and this only to a very limited extent. We have raised a few specimens of this pear every year for some eight or ten years. Exhibited three plates at our last State Fair. We have three or four varieties of seedling pears that look promising.

Cherries stood the hard frost in May better than either the apple or pear, and had it not been for the worms we should have had a

good yield. Plums were nearly a failure owing to the frost about May 22d. Currants, gooseberries, strawberries and raspberries were a grand success. Grapes came near being a failure, owing to our cold, backward season. I take this to be a gentle hint that we should make friends with hardy, early varieties, such as the Janesville, for instance.

A. W. SIAS.

The Secretary. I have some letters from Prof. J. S. Budd, of Iowa, and notes of his recent explorations for new and hardy fruits in Russia, which will be presented in another connection; but here is a letter from A. G. Tuttle, commenting on Prof. Budd's work and giving an account of his own trial of some of the Russians, sent me in response to the letters and notes of the Professor which I sent him for inspection, and with your permission I will read it here among the fruit reports:

BARABOO VALLEY NURSERIES.

BARABOO, Wis., Dec. 17, 1882.

Oliver Gibbs, Jr., Secretary, &c :

DEAR SIR: I have examined the letters of Prof. Budd and find a large proportion of the varieties of apples he found in Russia, the same in name as those I have on trial, and several of them I have fruited. I find as he says, there are several of the Duchess type so nearly alike in tree and appearance of fruit, that at first I thought them the same; but I find them later in ripening, of finer texture, less acids, and some of them very fine eating apples. One, the Summer Lowland, in season after the Duchess, is an excellent eating apple and should have the name of Autumn Lowland on account of its season. The tree is perfect. I have several of the Anis varieties; only one has yet fruited. I have fruited Zarsky Schip, Antonooka and Blackwood. I have several of the Aports, but have not fruited any yet.

The early apples, white and yellow Transparent, Charlottenthaler and Red Duck, I have fruited for three years, and find them to be the old early Harvest in quality; larger, handsomer and better for market, early and abundant bearers. They fill the bill perfectly for an early apple. They all seem very much alike in tree and fruit, except the Charlottenthaler grows larger; it will average as large as Duchess. For fall apples I have fruited several, many of them valuable additions to the list of fall fruit, especially where extreme

hardiness is required. Among the best are Zolotorff, Green Smoker, Titus apple, Zunpy Juicy and Vasselis Sayest, all large, showy apples, better in Quality than Duchess. The last named is similar to Alexander in tree and fruit, but unlike the Alexander, bears early and abundantly. This and Zunpy Juicy are like the Alexander, somewhat subject to blight. Of fall apples of medium size and good quality I have fruited Long Arcade, Gitmars, Beau Lerbosk, Queen, Switzer, Bun apple, Juicy White, Red Wine, Arabian and several others, less valuable. Of winter sorts, have fruited Borsdorf, Longfield, Apple Hiberl, Lord's apple, Anthony apple, Repka, Blackwood, Zuchenhausen, Red Queen, and a winter sweet apple (name lost) received before the importation by the government. Of sweet apples, Beautiful Arcade, Herdon's Streaked, Zarsky Schip, and the one without name.

During the fall I was absent much of the time and many of the apples, when there were only a specimen or two, got lost. As I made up my mind not to show the new Russians last fall, they were not saved. I send you a few sorts, most of them have been kept until recently in a warm room, and have become withered and lost their color in a measure. The Lord's apple is the smallest specimen that grew on the tree; the few others have been cut up to show callers interested in the new Russians.

They evidently, like the Golden Russet and Seeknofurther, should be kept from the air; most of the specimens were double the size. I hope to be able next fall to make a large showing of new Russians. With less work laid out for the season I think I shall be able to spare the time, and with a probable large addition to those already fruited shall be able to show a collection that will at least be satisfactory to myself.

I send you some new Russians fruited by a neighbor, not named. He has the trees correctly named but the fruit got mixed up and he could not be certain of giving them the correct names.

I am sure that the time and money spent by Prof. Budd and Chas. Gibb in their examination of fruits in Russia will largely benefit the whole prairie region of the extreme northwest.

I received an account of the extensive orchards around Sembirsk nearly twenty years ago, and have thought ever since that from them might be obtained valuable fruits adapted to all the colder regions of the United States and Canada.

I should like much to attend your meeting, but think it doubtful.

Yours, &c.,

A. G. TUTTLE.

President Sias. I have fruited the Borsdorf. It blossomed well, but only bore a few apples. Size somewhat larger than the Transcendent. I did not ascertain its keeping qualities.

The Secretary. Here is a letter from our old friend Jordan, whose absence from his accustomed place in these sessions has been noted and regretted. He is away among the orange groves of Florida, for the benefit of his health, and that of his family.

LETTER FROM R. B. JORDAN.

PALATKA, FLORIDA, Dec. 27, 1882.

Friend Oliver Gibbs, Jr., and friends of the Minnesota Horticultural Society.

As I sit writing and look out of my window upon a garden green with vegetables, and oranges, lemons, pomegranates, and bananas loaded with their yellow fruits, the pleasure and excitement have so scattered my thoughts from the stern necessity of top-grafting a few semi hardy trees upon the crabs to if possible make them more hardy, that I would not be able at this time to give you anything of interest unless it would be a description of this "land of flowers and sunshine," and as more ready and genial wits than mine have done their best with paper and pen, I will not tax your time and patience by saying more than that the change from a Minnesota winter with mercury 25 degrees below zero, to Florida with 70 above, with her fruits and flowers, actually takes from a Minnesotian for the time, all ideas of business.

Yours respectfully,

E. B. JORDAN.

Reports of delegates to other State societies being called for, Secretary Gibbs responded as follows:

Mr. Dart and myself were elected delegates at the same time; he to Iowa, I to Wisconsin. The Iowa Horticultural Society meets the same time as ours. He is off there now attending to his duties, and his report is expected in time for our Transactions of the year. The Wisconsin meeting was held two weeks after ours. I went down, accompanied by President Harris, who carried credentials from the Northwestern Society at La Crosse, but who kindly divided the responsibilities with me and deservedly got most of the honors of representing our society. I had to brace his courage up so that he could take the floor and make a little speech occasionally, but he rendered good service, and I was glad to have him there. Only once did his unsupported modesty fail him, and that was when speaking of the distribution of seeds by birds and animals to account for successions of plants and trees, sometimes

referred to spontaneous generation, a lady in the audience, who was closely following him in his treatment of the theme, transfixed him so completely with her wrapt attention as to arrest his mental flight and bring his remarks to an abrupt termination.

We found the State Agricultural and the State Horticultural Societies sitting in joint convention at Madison, and we were cordially received and hospitably entertained. The farmers were the most numerous, and had the most to say, but the fruit men had the best exhibition. In fact, we saw no grains, vegetables, or other farm or garden products at the meeting. Most of the farm talk was upon the dairy, the wool growing and the cattle breeding interests; but it was *meaty* talk in more senses than one—the speeches of men who had something to say and knew how to say it well. We were impressed by the ability and dignified appearance of these Wisconsin farmers and horticulturists, and picked out among them a score of men who would dignify the governor's chair, or the halls of either house of Congress if placed there. Not a word of "spouting" did we hear in the entire week; all solid, business-like speaking for the advancement of the industries of the soil.

Our mission there was principally to secure further reciprocities between the two States and societies in horticultural work. We proposed and were accorded an agreement to compete for premiums in each others exhibitions, on equal terms; that is to say, when we in Minnesota offer premiums on particular varieties grown here, they, if they have these varieties, may come in with us. On the other hand, we can compete in their exhibitions on any sorts in their list. In pursuance of this agreement, they awarded the first premium on a plate of Wealthies we took down, and several other premiums to our collection. They also agreed to furnish our society with forty copies of the report, annually, in exchange for the same number of ours.

The best results of our visit there you may not be able to identify, and need not be particularly mentioned. They will be scattered through the proceedings of this, and perhaps future proceedings of our Society, and in the Secretary's portfolio, and will come from the extension of acquaintances with horticultural writers and speakers, and the increase of knowledge obtained. Were it not for the opportunity I have as Secretary, in reference to our programs and transactions, to utilize the materials obtained in such a trip, I might be more specific in telling you what I saw and what I learned for my own and our Society's benefit in horti-

culture. As it is, however, perhaps I have herein said enough, and respectfully submit this as my report.

On motion of Mr. Gould, the report as to reciprocal arrangements about premiums and exchanges of reports was agreed to.

Next in order was a

REPORT ON GRAPES.

By C. H. GREENMAN, OF DOVER CENTER, MINN.

Mr. President, and gentlemen of the Minnesota State Horticultural Society:

By request of our secretary, I submit a short report on grapes.

The long term of wet weather during the fall of 1881, was not favorable to the thorough ripening of the wood, but owing to the mildness of the winter of 1882, together with the abundance of moisture in the soil, vines, with few exceptions, came through without injury either in roots or tops.

The exceptions were where they were on dry or gravelly knolls, together with a few vines planted too shallow, and these were in both cases injured in the roots.

Most of the bearing vines in this section were therefore in good condition when spring opened. A late frost hurt some of the early buds, still a good number of bunches set, and thanks for a late fall, nearly every variety which came under my observation, ripened their fruit.

Rev. Mr. Tibbetts, whose farm adjoins my own, had excellent Concord grapes, both in the size of the bunches and the quality of the fruit; he had one thousand pounds or more that didn't fully ripen; this was on account of the vines being too heavily loaded. His Janesville grapes showed some mildew, the berries being covered with small black spots; these vines are in the orchard, surrounded by a heavy willow hedge, and in close proximity to the Transcendent crab apple trees. We both raised the question, does not the blight from these trees affect the grape vines? Those nearest to the crab trees seeming to be the most affected. The Worden fruited with him for the first time, as also the Wilder and Lindley, and were very satisfactory. Wilder was very fine.

A small vineyard planted two years ago by Mr. Kinsman, 100 vines: 25 Worden, 25 Wilder, 15 Janesville, 10 Massasoit, 10 Agaman, 15 Delaware, all fruited the past season, and all give good promise for the future, except the Delaware.

My own vines with a few exceptions, give great promise, and in one or two years more I expect fruit in abundance. I now have 500 Worden, 500 Wilder, (R. H. No. 4.) 300 Massasoit, (R. H. No. 3,) 200 Agaman, (R. H. No. 15,) 50 Lindley, (R. H. No. 9,) 50 Salem, (N. H. No. 22.) 200 Janesville, 50 Champion, 100 Red Wyoming, together with a few of nearly all the new grapes. Of these, I expect the Worden will displace most of the black grapes in this list, and I predict that the Red Wyoming will come to the front among the red grapes; Though somewhat foxy, its beauty of bunch and berry, together with early ripening, and hardy vine, will make it desirable for market purposes.

Let the State Horticultural Society by all means encourage the planting of grapes, as well as all the other small fruits, that they may become so plenty that they will be used as a regular article of food, instead of a luxury to be enjoyed by a few.

Mr. Gould. At Lake Minnetonka the Delaware is the grape for market. 25,000 to 30,000 pounds were sold this fall in Minneapolis. Sometimes a ton a day were brought in. They used to sell at 12½ cents; this year they brought 20 cents, and did not get below 16. We did not have enough to supply the market.

Mr. McHenry. I have visited Elder Tibbits occasionally at Dover Center. His Janesvilles were much injured by the spring frost; Delewares, a failure. The Worden is the coming grape.

Mr. Pearce. Minnetonka is bound to become a great vineyard. Planters are doubling their areas in vines. The soil is peculiarly favorable. The fruit ripens, and is sweet, juicy, and wholesome. Doctors prescribe these grapes for their patients. They sell for prices about equal to drug prescriptions, and are taking their places.

Mr. Pepper. I recommend Moore's Early, for trial. It is about like Worden; probably a cousin or brother. Ripens as much earlier than Worden as Worden does earlier than Concord. Brighton is also a favorite. Does not mildew with me. Have had them in bearing three years, and seen no mildew. Prentice is a failure. Many of the vines of Prentice died down before frost. Moore's Early blossoms same time as Worden.

The Secretary. I saw and tasted Moore's Early last fall at Chase Brothers' office, Rochester, N. Y., ripe and good before there

were any other grapes in market in that region. I thought they were Concords at first, but Mr. Lewis Chase told me they were superior to Concord in flavor, as I would readily discover if I had the two varieties together for comparison.

Mr. Pearce. I got sixty roots of Moore's Early from Massachusetts for a customer. Trimmed them myself, and next season they were fifteen days earlier than the Worden. They are a favorite, and will be planted largely.

The Secretary. This, in connection with Mr. Greenman's statement as to the Worden, would place Moore's Early twenty-five days earlier than Concord. Allowance should be made for difference in some unstated conditions, as probably no one would claim that earliness for Moore's Early.

Mr. Gould. I have seen Worden at Excelsior. Grape is large and quality fine; superior to Concord, and Concord is a splendid grape. Worden is larger than Concord; see no defect in it.

Mr. Pearce. Some Wordens have been badly ruptured.

Mr. Peffer. During the frosty night of May 23, I was out till 2 o'clock building fires around my vineyard. Temperature was 32 degrees at my house, 30 degrees at vineyard. Do not think the fires did much good. Some of the vines had made considerable growth—8 or 10 inches. These killed. Those that had made but an inch or two of growth were not injured at all. Some thought they were hurt, but afterwards found they had wood enough.

Mulching being mentioned as a means of retarding growth and avoiding frosts in the spring, Mr. Kenney said he had used bagasse to mulch his Transcendents and they were free from blight.

Mr. Sias had used bagasse as a mulch for trees and was pleased with it.

Mr. Pearce thinks bagasse or straw for mulch will prevent blight, but it should be put on thick—say four to six inches—so as to retain a constant moisture.

C. F. Miller. If bagasse mulching will prevent blight it will be a great advantage. Mulching is much better for trees than cultivation in protecting them from the effects of hot weather.

Mr. Pearce. The sun does more harm to fruit trees than cold weather.

THE PEWAUKEE APPLE.

Mr. Phillips. This apple was originated by our friend Peffer. It is a seedling of the Duchess and the Northern Spy. Is not hardy in all locations, but if any of you have got a location where

you can grow it, you have a good thing. On the highland where I am it does well.

Mr. Eldridge. My Pewaukees have been bearing four years.

Mr. Poole, of Farmington. I have three Pewaukee trees in bearing. Last year and this year they bore heavy crops, and have paid better than any other variety.

The report of Committee on the Gideon Experimental Fruit Farm was called for, and not being forth coming, Prof. Porter said :

Mr. Gideon's object has been to produce hardy and long keeping varieties of the apple. Has planted 600 or 700 trees in double rows—hardy varieties alternately with long keepers. Planted five years ago, and came into bearing this year. Trees look well, and produced twenty or thirty bushels which were stolen by parties coming in boats. Mr. Gideon secured a few specimens, the seeds of which will be planted, and from the product of these seeds, the first results of his cross-breeding, may be looked for. Grapes have been successful. Pears not. Peaches have been grown and matured there in open air. The Regents will sell the Minnetonka farm at an early day, and consolidate experiments in pomology on the new farm of the State University. Mr. Gideon, however, will not be disturbed in his experiments, but will be allowed to go on in his own way.

The Secretary. I do not think Prof. Porter meant to be understood that peaches were growing at Minnetonka without protection. When I was at Mr. Gideon's place last winter I saw a number of small earth mounds in his grounds by the house, and was informed the peach trees had been laid down there and covered up. Our summer climate will ripen good peaches anywhere in Minnesota if the trees can be protected through the winter ; and I know of seedling peaches that grow and bear at Read's Landing without protection. They are in the garden of Wm. Dustin, on the northerly side of the river bluff facing the never freezing water at the junction of Lake Pepin with the Chippewa river. There too is where the pear trees stand that are referred to by Collins Pratt in the fruit report. It is a spot where the sun shines once a year—on the Fourth of July as a special compliment to the American flag.

Whether it is the constant coolness of the location or the vapor that rises there over the water, which in winter, as seen from Lake City, ten miles distant, looks like the smoke over combatants of a battle field, or both, that protects the trees, I cannot say, but am satisfied that this location or any other like it is a profitable one for fruit culture.

Mr. Pepper says he has grown peaches in Wisconsin forty years. Thirty-four out of forty they have fruited. First worked them on the wild plum. Got two crops, after which the trees died. Seedlings from these trees lived to be sixteen years old. Bent the stocks down and threw on brush and corn-stalks. Sold fourteen dollars worth one season from five trees. Have twenty-five trees yet. They were in good condition when I came away to attend this meeting. They are all budded on plum roots. Yearly stock is best to bud onto. Bud kills at fifteen degrees, new wood at 22 to 25 degrees, old wood at 28 degrees. Early Richmond buds kill at 16 degrees, pie cherries at 24 degrees.

The Secretary. Here again we must make allowance for conditions, as we scarcely, if ever, have a winter in Minnesota that does not freeze below 16 degrees, and our early Richmonds in good locations bear every year. It must be that a rule as to the number of degrees killing varieties, applicable to the Lake Michigan district, would vary considerably in Minnesota on same varieties.

President Sias. I think I will try peach planting in the spring.

Mr. Brimhall. I see that Mr. Gideon is present, and move that he be requested to give us a report of his experiments on the State farm at his place.

Mr. Gideon made a remark not fully understood by the reporter, but to the effect that when the society should meet him half way he would take part in its proceedings.

Mr. Elliot. And now Mr. President, our friend Gideon having come in here, I think it is a good time for us to make an effort for a reconciliation. We respect and honor him, but there has been an estrangement for some time, and I think the society ought to reconsider its position with reference to him. I move that a committee of three be appointed to confer with Mr. Gideon and report to-morrow.

The motion was seconded by Mr. Brimhall and unanimously adopted, and Messrs. Elliot, Gibbs and Eldridge appointed as such committee.

Prof. Porter. This may be a proper occasion to make a statement respecting the new experimental farm of the State University. The Board of Regents has sold the old farm to good advantage, and purchased a new one between Minneapolis and St. Paul, on the Lake Como road, a mile from Lake Como. The farm is well located and will be equipped in first class manner to carry on experimental operations in all branches of Agriculture, Horticul-

ture, etc. Lies on a gentle slope southeast, 100 acres smooth as a floor, 60 acres a bluff giving exposures in various directions. In the center of the bluffs a valley, in which we expect to make some of our horticultural experiments. Have cleared a portion of the ground, and will be ready to plant in the spring. Have all soils and exposures. The main horticultural work will be the propagation of seedling apples. The Regents wish to bring the farm into the closest relation with all recognized State agricultural and horticultural organizations, and request advice and counsel to be freely and unreservedly given from all.

THIRD DAY.

Thursday, January 18, 1883.

President Sias. I wish to make a motion from the chair this morning. Seedlings are the air line to the fruit growers' paradise. Nothing succeeds like success. None have succeeded like Peter M. Gideon. I don't care what his politics or religion are. I move that Peter M. Gideon be made an honorary life member of this society.

Motion adopted unanimously.

Mr. Brand moved that a committee of three be appointed to wait upon Mr. Gideon and inform him of his election.

Carried, and Messrs. Brand, Pepper, and McHenry, so appointed.

Pending which the committee appointed last evening to confer with Mr. Gideon, came in with their report, which was read as follows:

REPORT OF SPECIAL COMMITTEE ON RELATIONS WITH PETER M. GIDEON.

Mr. President:

The committee appointed to confer with Mr. Gideon, having performed the duty assigned them, recommend as follows:

1st. That Mr. Gideon be requested to furnish for publication in our transactions, a copy of his paper on Fruit Raising and Fast

Horses, which he was invited to read at our annual winter meeting in the year 1879, and which was withdrawn by him at that time after being partially read;

2d. That he be elected an honorary life member of the Minnesota State Horticultural Society, and invited to resume his active connection with the society; and that the executive committee be instructed to obtain his picture to be hung upon our walls.

3d. That it be understood that hereafter Mr. Gideon is to exhibit his fruits at our regular summer and winter meetings.

4th. That a committee be appointed to wait upon Mr. Gideon, and request his attendance at this meeting.

WYMAN ELLIOT,
OLIVER GIBBS, JR.,
H. D. ELDRIDGE,

Committee.

Mr. Brimhall moved the adoption of the report.

Motion seconded by Mr. Pearce.

Mr. Brand. That part of the report relating to Mr. Gideon's fruit at our exhibitions may be understood as requiring him to violate his convictions in regard to attending fairs where horse racing is carried on, and, if so, I would suggest its amendment.

President Sias. I agree with Mr. Brand.

Colonel Stevens. I don't know the first member of the Horticultural Society who favors horse racing.

Mr. Grimes. Perhaps the gentlemen are mistaken as to the meaning of the report. We have no horse racing at our meetings.

Mr. Brand. That is true; but we are sometimes advertised as exhibiting our fruits as a society in connection with the State Fair, and it might be understood as requiring Mr. Gideon to exhibit there, where horse racing is always a part of the program.

Mr. Elliot. The committee considered this matter in their interview with Mr. Gideon, and have endeavored, in the report, to obviate every difficulty. The society is not likely to race horses at our strawberry meeting in the summer, nor at any of our January meetings in winter.

(Secretary's remark, in copying. Not unless Mr. Elliot drives, and we can all take a ride after adjournment.)

The Secretary. Mr. Gideon understands the section referred to by Mr. Brand, and is satisfied with it.

Mr. Fuller. Do I understand that we are required to publish in our transactions Mr. Gideon's essay in full; the one we had some years ago?

President Sias. That is one of the committee's recommendations.

Colonel Stevens. I have already published it twice in a paper with circulation of 16,000, and want to publish it again. There is nothing in it that need hurt anybody.

The motion to adopt the report was then put and carried by a unanimous vote.

The Secretary will here remark that this was the fullest meeting, both of members and visitors, ever held by the Minnesota Horticultural Society, many having come in in anticipation of the spectacle of Mr. Gideon's return, quite a number coming forward, joining the society and paying their dollar to have the privilege of swelling what was known would be a unanimous vote.

Prof. Porter moved that Wyman Elliot be appointed a committee of one to bring Mr. Gideon in.

Mr. Elliott thought it would be more appropriate for Prof. Porter.

Prof. Porter was then appointed as such committee.

Mr. Underwood. I move that when Mr. Gideon comes in, the members rise, and that we have a recess of five minutes for congratulations.

Carried.

Prof. Porter returned with Mr. Gideon and said :

Mr. President and Fellow Members:

It is with great pleasure that I have the privilege to report Mr. Gideon's acceptance of the reconciliation you have offered, and I now have the honor to re-introduce him to the society.

President Sias (offering his hand). Mr. Gideon, I greet you, as you well know, most cordially. Please take the stand.

Mr. Gideon. Mr. President, and members of the State Horticultural Society: I am glad our differences are settled.

A general hand shaking here took place, after which Mr. Gideon was again called to the stand and gave a history of his experiments in fruit culture, which he was requested to write out for the Transaction, and which is as follows :

REMARKS BY PETER M. GIDEON.

I am very happy to be able once more to address you on the subject of fruit culture. I commenced the culture of fruit in Minnesota twenty-nine years ago by planting one bushel of apple seed and one peck of peach seed, and the next spring set about 400 trees of apple, pear, plum and cherry. And yearly thereafter for eleven years planted eastern and southern grown apple seed, and more or

less trees yearly of various kinds, and kept all as long as they could be made to live in Minnesota, and out of all that vast amount only three trees remain—one the Wealthy, another a fair apple, the other worthless. Since that time we have planted only of our own growing of seed with results far better than anticipated. For I did not expect to jump from the little crab to a large apple at a single bound, but we did, and also got very small crabs from the seed of large apples. I find that when crabs and large apples are grown in close proximity, the seed of the crab is as liable to produce large apples as is the seed of the large apple so grown, and the seed of the large apple so grown as liable to produce a crab as is the crab seed itself, and each so grown will produce about equal amount of hardy and tender trees. We set in orchard only those most promising, and not more than one in fifty give a first class apple in quality, but the others make good stocks on which to graft good varieties. We have some large apples of best quality from crab seed, but others as large or larger from same lot of seed were entirely worthless—mere trash—would begin to rot before ripe.

The best apple I have yet produced is a seedling from the Wealthy, in form, size and color almost an exact likeness of the parent apple, but differs in flavor and color of flesh, holds more firmly at picking time, and will keep from six to eight weeks longer.

Colonel John H. Stevens, having tested its qualities, said, in a report in the *Farmers' Union*, that it was the best apple introduced since Adam and Eve left the Garden of Eden, with which judgment I concur. But as to its real value to the Northwest, time and trial must tell. It set its second crop very full a year ago last spring (1881), but in June following the blight girdled it, leaving only a small sprout near the ground, and from that I am propagating, but it will be some years before the variety is fully tested. And until fully tested, and trees enough on hand to make my pile, will not be sent out.

As to blight, all varieties blight, and blight in proportion to the sap-flow at the time the atmospheric wave brings the epidemic along, the Russians being no more exempt than other varieties, and not the constitutional vigor to recover from blight injuries that our cross-bred seedlings have. We find some very nice varieties amongst the Russians, but our main hope is in our cross-bred seedlings to get a class of trees to stand all vicissitudes of our climate, and to that end the State orchard was set in motion. What to do, and how to do it, were problems that we successfully solved in our many and varied experiments, showing that the

seedling will ripen its fruit at or about the time the parent apple did from which the seed were taken. The Gideon apple showed the greatest variation, keeping two to three months longer than the parent apple from which the seed were taken.

The State orchard is only for the growing of seed, and no other orchard can be set so near as to adulterate it. It is set alternately in each row with an ironclad and a long keeper. The ironclads are our own best seedlings, and the long keepers are the best to be had from all parts of the word. Many of the long keepers fail on our cross-bred seedlings, especially on those seedlings showing most crab in their composition, but enough to me to make the trial a success. The crab gets its growth early and stops its sap-flow, hence we use it to top-graft later growing varieties on, as it stops its sap-flow and thereby compels the later growing variety to harden up for winter, and thus make a variety live and fruit that otherwise would kill every winter, and thus get fruit from long keepers, hardened by ironclads that will in time give us a class of ironclad long keepers of best quality, for in the orchard nothing but the best of varieties are used; nothing to adulterate; the success is double sure.

Four years ago last spring we started the State orchard on root or crown grafts just set, the roots being seedlings of one and two years' growth, and that it was successful, is only necessary to state that if intruders had let the fruit alone we would have had 12 or 15 bushels, but it was mostly taken. Got a few and planted the seed, so we are fairly in motion, and the result will soon be made manifest. We have 762 trees in the State orchard, and some 40 long keepers of best quality. Yet good as are our selection of varieties, we anticipate great extremes—utter worthlessness in some, and great perfection in others. For such has been the past, and the past is a guarantee for the future.

The Gideon and Rebecca apples are about the same in size, but differ in time of ripening, color and flavor, equally good, and of same origin—from seed of a crab of our own growing. Neither of them so large as the Wealthy, nor so fine in color. Season of Rebecca, September, while the Gideon will keep until January.

The blight killed the original Rebecca tree in the month of June, and before it had fruited, and being a promising looking tree, I cut scions from it after the leaves had wilted, and grafted into a tree near by, and thus saved a fine variety.

We claim no less than 15 varieties of extra nice seedlings of our own growing, the smallest being as large as the Transcendent

same season, and far better quality; and some 3,000 not yet fruited, from which we anticipate many fine varieties, and all attained in solving the problem, what to do and how to do it.

And now with those varieties as a foundation, and the knowledge how to use them, we are fairly in motion and in full faith that the future triumph is sure.

Col. Stevens read the following letter from President Harris, which on motion was ordered to be printed in the Transactions:

SEVILLE, MEDINA COUNTY, OHIO. }
January 16th, 1883. }

Members and Friends of the Minnesota State Horticultural Society:

For many weeks I have anticipated this meeting of our society with great pleasure, and had hoped to take you all by the hand, and while thanking you for the many expressions of good will and confidence in the past, wish you welfare and prosperity in the future. Very dear to me is Minnesota, my chosen home, and I expect to devote what little talent and ability I have in helping to develop her resources and build up her institutions. A higher duty, the duty a son owes to the mother who gave him birth and moulded his early years and fitted him for future usefulness, prevents my enjoying the privilege of this meeting and casts a sadness upon me. My aged mother is stricken down and is probably very near the grave. I have gone to her bedside to give what comfort and help I am able. Gentlemen, be assured of my best wishes for you and my devotion to the State Horticultural Society. May this meeting be pleasant to you all and profitable to the people of our State. May you work up a zeal and spirit of progress and carry it with you to your homes, and may the coming season be one of great prosperity to you all.

Your absent President,

JOHN S. HARRIS.

The matter of premiums for hardy winter apples was taken up for action.

The Secretary. At the June meeting of the executive committee I was requested to get this business into some shape as a basis for action, and as a first step I wrote to Mr. Pepper for a history of the Wisconsin system and asked him to make any suggestions that might occur to him to be of benefit to us. He replied and gave me the information on which the scheme I will now present, is based. I will not offer it for adoption, but only for your consideration, as perhaps containing some of the points you may want in offering the contemplated premiums.

SCHEME FOR PREMIUMS FOR HARDY LONG-KEEPING WINTER APPLES.

The Minnesota State Horticultural Society hereby offers the following premiums for ten years for the production or importation of hardy, long-keeping varieties of winter apples adapted to Minnesota soil and climate;

For the first five years, payable annually. 1st best, \$5; 2d best, \$3; 3d best, \$2; and to the variety winning the highest cash aggregate of the premiums in this period, \$25 additional; 2d highest aggregate, \$15; 3d highest aggregate, \$10.

For the second five years, payable annually. 1st best, \$22.50; 2d best, \$17.50; 3d best, \$15; and to the variety winning the highest cash aggregate of the premiums in this period, \$500 additional; 2d highest aggregate, \$300; 3d highest aggregate, \$200.

Provided, that the varieties competing for the \$500, \$300 and \$200 premiums, shall not be awarded either of the said premiums, until they shall have been fruited in each congressional district of the State, and proven to the satisfaction of the State Horticultural Society, and agreed to by a two-thirds vote, to possess all of the following merits:

- 1st. Hardiness, equal to the Duchess of Oldenburg.
- 2d. Productiveness of tree and size and quality of fruit, equal to the Wealthy for cooking purposes.
- 3d. Keeping qualities, equal to the Willow Twig.

If either of said varieties fail in the foregoing qualities, and yet remaining in the rank of 1st, 2d or 3d best of all varieties entered, it shall be awarded a reasonable premium according to its merit at the discretion of the Society.

Entries must be made annually with the Secretary of the Society on or before the 1st day of September in each year, and specimens of fruit and wood of the tree, and scions for distribution, be furnished under such regulations as may be hereafter prescribed.

Persons wishing to compete for these premiums by the trial of new seedlings are referred to the published transactions of the Society for 1883 for information as to apple breeding by cross pollenizing.

Mr. Fuller moved the adoption of the plan.

President Sias. As a rule trees do best where they originate. While the Wealthy succeeds here, it might not in Russia. The plan makes no distinction as to origin of varieties, and I think we had better restrict the premiums to Minnesota seedlings.

The Secretary. The idea in the scheme presented is that it makes no difference where the apple comes from, or how it comes, so that we get the hardy, long-keeping sorts we are after. Provision is made for long and complete tests before awarding the premiums.

Mr. Underwood. The subject is very important, and demands serious consideration. I want the apple to be better than any now known. Do not think it best to limit the manner of its production. Hope every member will study the subject and help devise a system of premiums that will be the best for the end in view.

Mr. Fuller. I agree with the spirit of the paper presented. I don't care where the apple comes from. I think a trial of ten years bearing in Minnesota will test its hardiness. Have no confidence in Russian varieties, but am willing they should compete.

Mr. Pearce. Ten years is too long a term to require for a test of hardiness. Three years, or even one year, is sufficient. Seasons differ. Corn ripens one year and not another. Seasons and not length of time test the hardiness of varieties. Hardiness of trees is ascertained by the number of days it takes to ripen the wood. The true test is whether our shortest seasons are long enough to ripen the wood. Ripe wood does not winter kill.

Mr. Whipple. I do not agree with Mr. Pearce. I suppose all know the Pioneer, originated at Excelsior, was thought to be iron-clad, but the winter of 1872-3 killed the tree dead. Many trees live eight or ten years and then there comes a winter that kills them all at once.

Mr. Pearce. I have made trees a study for many years. The season previous to the winter of 1872-3, was very unfavorable, owing to drouth. The ground got so dry in the fall we could not dig, and many trees died from drouth alone that season.

Mr. Phillips. If time of test be changed, I would lengthen rather than shorten it, and put the probation at fifteen years instead of ten.

Mr. Underwood moved, as an amendment to Mr. Fuller's motion, that the Secretary's plan for premiums on new varieties of winter apples be printed and laid over till next meeting, for consideration.

Mr. Fuller accepted the amendment, and the motion so amended was then adopted.

Mr. Gideon, in reply to a question. I got the seed from which I grew the Wealthy from Albert Emerson, of Bangor, Maine. It was sent to me as Cherry Crab seed.

QUESTION BOX.

Has any one here tried the Russian Mulberry?

Colonel Stevens. They are hardy, but not desirable, being too scrubby.

Mr. Gideon. They put up a strong stem like native mulberry. I am favorably impressed with them.

Prof. Porter. When I visited Mr. Gideon's grounds and examined his mulberries, I thought well of them for hedges, wind-breaks, and ornamental trees, and set 1,000 on the experimental farm. They started slowly, but afterwards grew rapidly. Some made four feet growth last season. Have 600 living. If this tree can be grown, the silk culture will be remunerative. We get two crops of cocoons, while in Europe they only get one. The fruit, also, is valuable. The only objection is the lateness in starting in the spring.

Mr. Gould. I am not satisfied with the Russian mulberry, and think we had better go slow on it till we know more about it. I was disappointed when I dug the first tree. The root was yellow and pliable. Seems to be a tender root. I doubt its hardiness.

Mr. Pearce. A man informed me that the mulberry was the only fruit grown in Siberia, except a small crab. The same man saw my trees, said they were the identical ones, and took 1,000. Mine grew four feet first season from cuttings. They are tender the first year, but hardy afterwards. A counterfeit mulberry is in circulation. The true Russian mulberry has a cut leaf; the counterfeit has not. Do not think we need have any fears but that a tree that survives out at Mountain Lake will endure the winters anywhere in Minnesota. The Mennonites say you must cut them down the second year, when new shoots will spring up, and the leaves of these are fed to the silk worms.

Mr. Gideon. I could not see any difference in hardiness between the round leaf and the cut leaf varieties, but noticed that the round leaf kind bore the best fruit.

Governor Colman. The tree is likely to be valuable to settlers in prairie districts, on account of its easy propagation. The tree is hardy in Nebraska, and probably will be here.

President Sias. I got one berry from Downing's ever-bearing mulberry. Others say it is not hardy.

Prof. Porter. It is valuable where it can be grown.

AFTERNOON SESSION.

THIRD DAY.

QUESTION BOX.

Has any member of this society tested Stone's Hardy blackberry?

President Smith. It does well in Wisconsin. Have never heard a contrary report.

Mr. Cutler. The Snyder does well with me. Have picked 200 quarts from eight rods. It does not kill out.

Truman M. Smith. The Snyder winter kills about St. Paul.

President Smith. It is best to protect by bending down and covering.

Mr. Pearce. Much depends upon the condition of the plant and state of the soil whether they kill or not. One very dry season after the leaves had fallen, they started a second growth, and mine all killed but one. It is easy to tell in the fall whether the vines are going to kill. See if the wood is ripe.

Mr. Cutler. An old root will stand more freezing than a young one. Care should be taken not to cultivate too late.

T. M. Smith. I have never found any blackberry hardy enough for Minnesota except the wild ones.

Col. Stevens. That is my experience.

Mr. Phillips. A fine show of Stone's Hardy was made at the Rochester State Fair—Minnesota grown—and it yields better than Snyder.

President Sias. Stone's hardy is better than Snyder, but won't do to trust in cold winters without cover.

Mr. Cutler. Turner raspberries killed at the tip when Stone's Hardy blackberry did not.

T. M. Smith. I see no difference between old and new beds as to winter killing, but on rich, heavy, low soil, they kill worse than on light soils on elevated sites.

The Secretary. It is now well known that we can have blackberries for home use—good ones like Snyder and Stone's Hardy, by covering in winter; but can this covering be done on a large scale so as to grow them profitably for market? That is the question now with both blackberry and raspberry, and I hope some one will be able to answer it at our next meeting.

Has any one ever known the roots of apple trees killed by freezing?

Mr. Fuller. Yes.

Mr. Pearce. I think not.

The society took a recess to listen to the address of Gov. Colman in the amber cane convention, and resumed business afterwards.

W. J. Abernethy and A. J. Phillips read the essays they had entered for the prize offered for the best essay on Orchardling in Minnesota.

FOURTH DAY.

FRIDAY MORNING.

The essay of Mr. Pearce on Orchardring in Minnesota, entered for the prize of the society, was read by Assistant Secretary Stearns.

Secretary Gibbs. It will be physically impossible to get through the mass of important business accumulated for this the last day of our meeting, if we take time to read the other three essays. I regret to make the motion to refer them without reading and discussion, as they are all good ones, but am obliged to ask that they be put over in order to clear our business docket if possible.

The motion was agreed to, and the committee was authorized to order any of the essays published in the Transactions at their discretion.

The secretary then read a list of the premiums awarded and announced that a certified list had been placed in the hands of the treasurer in a convenient form for immediate payment.

Treasurer Grimes invited those who had premiums due them to call on him at the office of Prof. Porter, in the room adjoining, where he would be ready with funds to pay in full, and the premiums, so far as called for, were then paid.

The list of entries and the premiums awarded is as follows :

LIST OF ENTRIES AND OF THE PREMIUMS AWARDED.

DISPLAYS.

DISPLAY OF APPLES BY NURSERYMEN.—A. J. Phillips, 1st premium;
A. W. Sias, 2d premium.

DISPLAY OF CRABS BY NURSERYMEN.—A. J. Phillips, 1st premium.

DISPLAY OF APPLES BY AMATEURS.—Collins L. Pratt, 1st premium.

DISPLAY OF RUSSIAN APPLES.—A. G. Tuttle, Baraboo, Wisconsin, 1st
premium.

DISPLAY OF WEALTHY APPLES.—M. Pearce, 1st premium.

DISPLAY OF POTATOES.—Wyman Elliott, 1st premium; W. E. Brim-
hall, 2d premium.

DISPLAY OF NEW VARIETIES POTATOES (not before exhibited at winter
meeting.)—Wyman Elliot, 1st premium.

DISPLAY OF WINTER VEGETABLES.—W. E. Brimhall, 1st premium.

DISPLAY OF GARDEN SEEDS, MINNESOTA GROWN.—Hiram Web-
ster, 1st premium.

SINGLE PLATE ENTRIES AND PREMIUMS—APPLES.

WEALTHY.—Collins L. Pratt, 1st premium; A. J. Phillips, 2d premium.
Wm. McHenry, J. T. Grimes, David Whittaker, M. Pearce, Ditus Day, Sid-
ney Corp.

FAMEUSE.—A. J. Phillips, 1st premium; A. W. Sias, 2d premium. Wm.
McHenry, Ditus Day, J. H. Cowan.

SAXTON OR FALL STRIPE—A. W. Sias. No award.

BEN DAVIS—J. S. Harris, 1st premium; Wm. Forster, 2d premium. Geo.
P. Pfeffer.

WALBRIDGE—A. J. Phillips, 1st premium; J. S. Harris, 2d premium. A.
W. Sias, Collins Pratt, C. C. Low.

AMERICAN GOLDEN RUSSET—A. J. Phillips, 1st premium;
2d premium. Geo. P. Pfeffer, C. C. Roberts.

ENGLISH GOLDEN RUSSET—Collins L. Pratt, 1st premium; Geo. P.
Pfeffer, 2d premium.

PERRY RUSSETT—A. J. Phillips, 1st premium; C. C. Roberts, 2d premium.

ROLLINS RUSSET—Wm. McHenry, 1st premium.

ALLEN RUSSET—Geo. P. Pfeffer, 1st premium.

PLUMB'S CIDER—A. W. Sias. No award.

TALMAN SWEET—A. J. Phillips, 1st premium; J. S. Harris, 2d premium.
A. W. Sias, Ditus Day, J. H. Cowan.

PRICE'S SWEET—A. J. Phillips, 1st premium.

SWEET GREENING—A. W. Sias, 1st premium.

SWEET PEAR—A. J. Phillips, 1st premium.

WESTFIELD SEEKNOFURTHER—A. W. Sias, 1st premium.
 WILLOW TWIG—A. J. Phillips, 1st premium ; J. S. Harris, 2d premium.
 UTTER, COOPER, or LUCY—A. J. Phillips, 1st premium; Collins L. Pratt, 2d premium. Wm. McHenry, J. T. Grimes.
 MALINDA—Collins L. Pratt, 1st premium.
 ROLLINS' PIPPIN—Wm. McHenry, 1st premium.
 PIONEER—F. G. Gould, 1st premium.
 JONATHAN—J. S. Harris, 1st premium; A. J. Phillips, 2d premium.
 PEWAUKEE—A. J. Phillips, 1st premium; Collins L. Pratt, 2d premium.
 RED REIUNET—A. J. Phillips, 1st premium.
 WOLF RIVER—A. J. Phillips, 1st premium.
 ELGIN BEAUTY—A. W. Sias, 1st premium.
 WINE SAP—A. J. Phillips, 1st premium.
 HAAS—Collins L. Pratt, 1st premium; A. J. Phillips, 2d premium. Wm. Forster, S. Corp, C. C. Roberts.
 BLUE PEARMAIN—A. J. Phillips, 1st premium; A. W. Sias, 2d premium.
 HERFORDSHIRE PEARMAIN—A. J. Phillips, 1st premium.
 POME GRISE—A. J. Phillips, 1st premium.
 ALEXANDER—A. J. Phillips, 1st premium.
 PUMPKIN SWEET—Geo. P. Peffer, 1st premium.
 MCINTOSH RED—A. W. Sias. No award.
 FALL ORANGE—A. J. Phillips, 1st premium; A. W. Sias, 2d premium.
 ST. LAWRENCE—A. W. Sias, 1st premium.
 PENDANT EAR—A. W. Sias. No award.
 MORROW'S RED—A. W. Sias. No award.
 FALL SPITZENBERG—A. W. Sias. No award.
 ATWOOD SEEDLING—A. J. Phillips, 1st premium.
 BALTIMORE—A. J. Phillips. No award.
 RUBICON—A. J. Phillips. No award.
 PARK'S KEEPER—A. J. Phillips, 1st premium.
 UNKNOWN VARIETY—C. C. Roberts. No award.

NEW SEEDLINGS FOR GENERAL PURPOSES.

Wm. Forster, 1st Premium; Collins L. Pratt, 2d premium; Sidney Corp, 3d premium. John Wagner, 5 kinds; Wm. Forster, 2 kinds; D. K. Michenor, 2 kinds; G. W. Harrington, 2 kinds; S. Corp, 2 kinds. J. S. Harris, A. J. Phillips, E. Paulson.

NEW SEEDLING SWEET APPLE.

A. J. Phillips, 1st premium; Collins L. Pratt, 2d and 3d premiums.

SINGLE PLATE ENTRIES AND PREMIUMS—CRABS.

MINNESOTA—A. J. Phillips, 1st premium.
 LAKE WINTER—A. J. Phillips, 1st premium.
 GILLIFLOWER CRAB—Collins L. Pratt, 1st premium.

MEADER'S WINTER.—A. W. Sias, 1st premium; A. J. Phillips, 2d premium.

MAIDEN'S BLUSH.—A. J. Phillips, 1st premium.

AKIN'S STRIPED WINTER.—A. J. Phillips, 1st premium; Ditus Day, 2d premium.

QUAKER BEAUTY.—Ditus Day, 1st premium.

ORANGE.—A. J. Phillips, 1st premium.

HYSLOP.—A. J. Phillips, (no award). S. Corp.

MISCELLANEOUS ENTRIES AND PREMIUMS.

GRAPES.—Truman M. Smith, 1st premium, Diana; G. S. Woolsey, 2d premium, Diana. Truman M. Smith, Roger's No. 15; F. G. Gould, Diana.

CELERY.—Fred. Busch, 1st premium; W. E. Brimhall, 2d premium.

HUBBARD SQUASH—Richard Poole, 1st premium; J. T. Grimes, 2d premium.

CARROTS.—W. E. Brimhall, 1st premium; Richard Poole, 2d premium.

PARSNIPS.—W. E. Brimhall, 1st premium.

YELLOW DANVERS ONIONS.—W. E. Brimhall, 1st premium; G. S. Woolsey, 2d premium. Richard Poole.

WHITE GLOBE ONIONS.—G. S. Woolsey, 1st premium.

RED GLOBE ONIONS.—Richard Poole, 1st premium.

HOME MADE VINEGAR.—Knight Whipple (maple), 1st premium.

MAPLE SYRUP.—Knight Whipple, 1st premium.

SINGLE ENTRIES AND PREMIUMS ON POTATOES.

EARLY VERMONT.—J. T. Grimes, 1st premium.

BEAUTY OF HEBRON.—Wyman Elliot, 1st premium; Knight Whipple, 2d premium. W. E. Brimhall, G. S. Woolsey.

EARLY OHIO.—Wyman Elliot, 1st premium; Knight Whipple, 2d premium.

CLARK'S NO. 1—Wyman Elliot, 1st premium.

GIDEON SEEDLING—Oliver Gibbs, Jr., 1st premium; Wyman Elliot, 2d premium.

WHITE STAR—Wyman Elliot, 1st premium.

ONE HUNDRED FOLD FLUKE—Oliver Gibbs, Jr., 1st premium.

CHICAGO MARKET—Wyman Elliot, 1st premium.

WHITE ELEPHANT—Wyman Elliot, 1st premium.

BELLE—Oliver Gibbs, Jr., 1st premium; W. E. Brimhall, 2d premium.

BURBANK—J. T. Grimes, 1st premium; Knight Whipple, 2d premium. W. E. Brimhall.

TIOGA—A. S. Johnson, 1st premium.

JORDAN'S PROLIFIC—Oliver Gibbs, Jr., 1st premium.

DUNMORE—W. E. Brimhall, 1st premium; Knight Whipple, 2d premium.

QUEEN OF THE VALLEY—Wyman Elliot, 1st premium.

AMERICAN GIANT—Wyman Elliot, 1st premium.

EARLY PEACHBLOW—Wyman Elliot, 1st premium.

ALPHA—Wyman Elliot, 1st premium.

EARLY HOUSEHOLD—Wyman Elliot, 1st premium.

ADIRONDACK—Wyman Elliot, 1st premium.

LA PLUME—W. E. Brimhall, 1st premium.

MAMMOTH PEARL—W. E. Brimhall, 1st premium; Knight Whipple, 2d premium.

SNOWFLAKE—G. S. Woolsey, 1st premium; W. E. Brimhall, 2d premium.

\$10 Premium Offered by Wyman Elliot, for Best New Seedling Potato.

W. E. Brimhall, 1st premium; Richard Poole, 2d premium. To be divided.

The varieties entered by Wyman Elliot for premium on best display of new varieties, not before exhibited at a winter meeting, were as follows :

White Star, Queen of the Valley, Early Peachblow, Pride of America, Early Mayflower, Brownell's Best, American Giant, Vermont Champion, Gem, Early Household, Alpha, Adirondack, Garfield, Early Telephone.

The amount of premiums awarded and certified to the treasurer for payment, was as follows:

On Fruits.....	\$63 00
On Vegetables, etc....	36 25
On Flowers.....	9 00
Total.....	\$108 25

The secretary moved that hereafter no premium be awarded on seedling apples unless the entry be made before September 1st, and the tree examined and reported on by the committee on seedlings.

The motion prevailed.

The secretary announced the appointment of James Bowen as Librarian, and an appropriation of \$10 was made for his postage and other incidental expenses to be accounted for at the next meeting.

RESOLUTIONS ADOPTED.

By Mr. Pearce.

Resolved, That the chair appoint a committee of five to attend a joint meeting of committees of State organizations, to be held at St. Paul on Tuesday, January 30, 1888, for the purpose of effecting, if possible, a closer articulation of the said societies in the conducting of their respective work within the State.

Committee appointed on this resolution, President and Secretary and Messrs Stevens, Wells, White, Brimhall and Elliot.

By Mr. Phillips.

Resolved, That in pursuance of the suggestion of President Harris, contained in his annual address, the Secretary be requested to embody in the coming volume of the society's transaction "a Secretary's portfolio," and to publish therein such matters as he may deem of general interest to the society.

By Mr. Brimhall.

Resolved, That the committee on legislation be instructed by this society to have the law so amended as to make the legal weight of onions fifty pounds, which is the actual weight of a bushel of onions, instead of fifty-seven pounds, which is now the law.

By the Secretary.

Resolved, That in view of the increase of the business transacted by this society, and the additional amount of matter necessary to be embodied in its published transactions, and in view of the growing importance of the horticultural interests of the State, which are to be subserved by the dissemination of useful information upon this subject among the general population of the State, the legislature be requested to amend the existing law governing the publication of the annual report of this society, (chapter 72, General Laws of 1881—page 10 of our Trans., 1882) by inserting 500 in place of 300 as the limit of pages, and by striking out the conditional \$750 as to cost of publication, and that this resolution be referred to Prof. Porter and S. M. Emery as a committee on legislation, and that they be requested to use their influence to procure the proposed legislation.

The Society then proceeded to the election of officers, committees and delegates, as follows:

PRESIDENT.—J. S. Harris, La Crescent.

VICE-PRESIDENTS.—A. W. Sias, Rochester; F. G. Gould, Excelsior; Oscar Ross, Center City; G. W. Fuller, Litchfield; E. H. S. Dart, Owatonna.

SECRETARY.—Oliver Gibbs, Jr., Lake City.

TREASURER.—J. T. Grimes, Minneapolis.

EXECUTIVE COMMITTEE.—J. M. Underwood, Lake City, chairman; O. F. Brand, Faribault; M. Pearce, Minneapolis; W. E. Brimhall, St. Paul; F. G. Gould, Excelsior; President, Secretary, and Treasurer, *ex officio*.

ENTOMOLOGIST.—R. J. Mendenhall, Minneapolis.

DELEGATES TO OTHER SOCIETIES.

WISCONSIN HORTICULTURAL SOCIETY.—Oliver Gibbs, Jr.

IOWA HORTICULTURAL SOCIETY.—E. H. S. Dart.

MISSISSIPPI VALLEY HORTICULTURAL SOCIETY.—J. T. Grimes.

STATE AGRICULTURAL SOCIETY.—Colonel J. H. Stevens, J. M. Wells, M. C. White, W. E. Brimhall, Wyman Elliot, and Treasurer and Secretary, *ex officio*.

COMMITTEE ON EXPERIMENTAL STATIONS.—Prof. Edward D. Porter, G. W. Fuller, S. M. Emery, A. W. Sias, H. D. Eldridge.

COMMITTEE ON LEGISLATION.—Prof. E. D. Porter, S. M. Emery.

On motion, the appointment of the remaining committees was referred to the President.

President J. M. Smith announced the Wisconsin meeting to be held at Madison, commencing February 5th, and extended an invitation to the Minnesota horticulturists to attend.

The Secretary. It has been understood that at some convenient time during this meeting the seedling apples on exhibition would receive some further attention. Mr. Elliot and Mr. Bowen have displayed them in a group by themselves on this table here in front of the audience, and I now move that we have a description of them, plate by plate, as to tree and fruit, by those who happen to be acquainted with the facts.

The motion prevailed, and the seedling apples were described as follows:

The 1st premium seedling for general purposes.—A red apple, size and shape like Fameuse, and flavor similar. Grown by William Forster, Chatfield, Fillmore County, Minn. Mr. Forster says the tree is about fifteen years old, five or six years in bearing; bears annually; seems hardy; single limbs may blight a little; no bearing tree near; is hardier than Fameuse; apple keeps till March.

On motion named Forster's Winter.

The 2d premium seedling for general purposes.—A reddish, streaked apple, size and shape like Wealthy, mild, subacid, not superior in quality, but fair to good. Grown by Collins L. Pratt Millville, Wabasha county, Minn. Mr. Pratt says the tree is about ten years old, low headed, never winter-kills; bore for first time last year; season, say about March. You see for yourselves it must be a good keeper.

Named Pratt's Red Winter.

3d premium seedling for general purposes.—A rather sprightly subacid, green apple; looks like the R. I. Greening, but is smaller; season March. Grown by a Mr. Wilkey. Sent here by Sidney Corp, Hammond, Wabasha county, Minn. This is the apple described in Mr. Corp's paper entitled "Farmers' Experience."

Named Wilkey's Greening.

1st premium seedling sweet apple.—A very large, handsome greenish apple, slightly streaked; flavor medium to good; season March to May. Grown by A. J. Phillips, West Salem, Wis., Mr. Phillips says the original tree was set out four years old, in 1873; did not bear till 1880; thinks it is as hardy as the Duchess; sent specimens to Mr. Peffer who made drawings and descriptions of it in 1880. In 1881 it bore one peck; in 1882 a bushel and a half. No wind can blow it off; did not find a single apple under the tree during the summer. It is a long keeper, but not first quality.

Mr. Pepper's drawings and descriptions of this apple, made in 1880, were then exhibited and compared with the fruit on the table and found to identify it perfectly.

Secretary Gibbs. Here are five plates of seedlings from an orchard consisting entirely of seedling trees growing on the farm of John Wagner, in the town of Belvidere, Wabasha county. The seed was planted by a man at Hastings in 1855, so I was informed by Mr. Wagner, and in the following, or the next year after, they were transferred to their present location. They never had a fence around them, or at least there is no appearance of there ever having been one, but stand out on the open prairie without any shelter or protection. There are about thirty trees in all—all looking well, and mostly bearing good annual crops. This plate of fair sized, red, subacid apples makes the best showing of anyone. It has a bright dark red color, with faint, fine stripes of white; quality just fair; but it is a true keeper, and worthy of trial. I have known it three years and have a number of grafts of two years' growth on Transcendent, growing finely and likely to fruit next season. I will name it the Belvidere. The tree is hardy and a good grower. The others have some merits as cooking apples—one is large and yellow, but very acid; the smaller ones are better quality; all five are good keepers. This orchard has value for its seeds to plant for hardy stocks for top-working, as it must be that in their twenty-eight years successful buffeting of the extremes of our climate, heat, cold and drought, and their endurance hardily to this time, their seeds have acquired some stamina for the benefit of their progeny; and they may have a further value for cross-breeding of new sorts on the plan of Mr. Pepper or Mr. Gideon.

President Sias. Mr. Phillips had his seedlings at the State Fair, and we thought them poor in quality; but later on they got better.

Mr. Phillips. I have another seedling tree that we think a great deal of at home. It came from seeds brought from Vermont and planted in 1861 or 1862. Here it is. You see it is large size, longish in shape, not a handsome apple in color, being kind of an uncertain mottled green; nobody takes any notice of it at exhibitions; it never takes any premiums; yet it is of good quality and a late keeper, and a constant, free annual bearer. We can always depend on it for some good apples in the cellar all winter. It bore fruit in 1870. The old tree shows no decay, and I have twenty-five young trees from it just coming into bearing. Atwood seed-

ling is a good apple. I know but little of it except that it was originated by Dr. Atwood.

Secretary Gibbs. Mr. Wilcox recommends the Atwood and grows it in his orchard at La Crosse.

Mr. Elliot showed seedlings raised by Andrew Hartman. Wood a little stained.

D. K. Michenor, Etna, Fillmore county, exhibited a long keeping, keen subacid yellow apple, and the secretary held up a plate of large apples grown by President Harris from seed of Transcendent crab.

G. W. Harrington, Plainview, showed the seedlings from trees said to be as hardy as oaks and of ages from eleven to twenty-six years old. Apples rather small, but may have value for breeding stocks.

Many other seedlings were entered and some of prepossessing appearance, but not being accompanied by notes, and unknown to the secretary, are not described.

All these seedlings are subject to re-entry for the next annual meeting under the rule requiring entries to be made before September 1st, and trees to be examined by seedling committee, and it is hoped all the good seedlings in the State, or in northern Wisconsin, will be so entered and shown, as liberal premiums will be given on three best seedlings at the annual winter meeting in January, 1884.

The Secretary. If there is any desire on the part of the society to change its place of meeting, an invitation is extended to locate for a summer or winter meeting, or both, at Lake City. We can furnish a good hall and entertain the members with cordial hospitality.

Col. Stevens moved that both the summer and winter meetings be held at Minneapolis, and that the time of holding and all arrangements for the summer meeting be left to the executive committee.

The motion was adopted without dissent.

QUESTION BOX.

A PRIMARY LESSON IN HORTICULTURE.

If Duchess after setting should die and sprout again and the sprout bear, would the apple be a *seedling*?

President Sias. If the Duchess was on its own roots, the sprout would be Duchess; if grafted on a seedling root, the sprout, if coming from below the point of union, would be a seedling.

The Secretary. This question is asked in good faith by some one, and I will give it a more extended answer, as the record may attract the attention of some of the younger readers of our reports, and may be the beginning of an education in horticulture. Nursery apple trees are usually propagated by cutting off the root of a little tree of one year's growth that has been raised from the seed, and inserting in this root by a process known as tongue-grafting, a scion of the variety we want to grow. Of course the top or stem of the seedling is thrown away, and forms no part of the new tree. This seedling root and scion, or "root graft," as we now call it, is set out in the nursery row, and when it has grown up into a little tree of four to six feet in height, say in two or three years, it is ready for transplanting to the orchard. Now, if your Duchess tree was so made, and died down to the point where the scion was inserted in the seedling root, the sprout would come from that root, and of necessity be a seedling; but if there was life left in the stem above the point of union, and if the sprout came from there, it would be only a renewal of the Duchess, and the fruit would be Duchess.

Sometimes trees are made by top-working; that is, by budding or grafting into the limbs of seedlings or other stock. It is not uncommon to have a tree with seedling root, a grafted stem on it, and another sort top-worked upon that; or you may have as many sorts in the top as you can find limbs to bud or graft into. One way to increase our list of good apples in this climate will doubtless be by planting the seeds of our own hardy seedling apples and top-working the sorts we want into the tops of this second generation of Minnesota seedlings. Some excellent varieties are found in other States doing well when top-worked into seedlings and failing on their own stems.

It is customary in root grafting to use a short root and a long scion, and set deep so as to encourage hardy roots to come out from the scion, and most of the sprouts that come on trees that kill down are from the scion.

What is the average crop of grapes to the acre in the vicinity of Lake Minnetonka?

Mr. Gould. 3000 to 4000 pounds.

The secretary stated that one-fifth fare certificates were ready at the desk for members who wished to return to their homes by

any of the railroads running into St. Paul or Minneapolis, except the Northern Pacific and the Manitoba, and in response to an inquiry that concessions had been refused by these roads, and the society referred to their round trip system of $3\frac{1}{2}$ cents per mile, open to the general public. He had written to the General Ticket Agents of these two roads, alluding to the benefits the society would probably confer upon the business of their roads by introducing fruits that would endure the climate in the territory mostly tributary to them, and thus encouraging immigration, and asking that the rate be relaxed in favor of members coming in from the north and west. One of the officers referred to politely expressed his regrets that he could not give us reduced rates, but the other thought we ought to be satisfied with $3\frac{1}{2}$ cents per mile.

On motion of Col. Stevens, the thanks of the society were tendered to railroads making special rates to members.

AFTERNOON SESSION.

FOURTH DAY.

President Sias appointed Messrs. Phillips, Peffer and Fuller a committee on final resolutions.

Mr. Hodges appeared before the society as per program, and read his paper, as follows:

FACTS ABOUT FORESTRY.

BY LEONARD B. HODGES OF ST. PAUL.

Accepting an invitation of the Minnesota State Horticultural Society to address them on the subject of Forestry, I offer this paper. No economic question of the present has a greater bearing on the future well-being of the State than forestry. I use the term "State" in its broadest sense. The old-fashioned word commonwealth is more significant, inasmuch as on its broad face it suggests the idea that there is [a species of wealth that can be enjoyed by all the citizens of the State. The wealth of forestry, with its attendant comforts, is of that kind, and its blessings reach out beyond the immediate control of the legal proprietor of the forest, and embraces within its ameliorating influence his more immediate neighbors, whether friends or foes; and so as the good work goes on from one neighborhood to another, the actual wealth first developed by a few, to a very large extent becomes the common wealth of the many.

The pioneer farmer out on our oceanic prairies, who surrounds his quarter section with a broad belt of forest trees, protects not only his own fields and crops from the damaging effects of storms,

but also to a great extent protects his adjoining neighbors, who, in common with him, enjoy the wealth he has developed, and he can no more prevent them from the enjoyment thereof, than from the benefits of sunlight or rainfall, which are the common wealth of all God's creatures. Hence I take the ground that it is not only eminently proper, but that it is the duty of the State, in every suitable way, to aid by appropriate legislation in the development or creation of this sort of common wealth. Further on in this paper, if I find I have room, I shall advert more fully to the pressing necessity of State and national legislation for the protection and encouragement of forestry, and if I succeed in stirring up

THE WHOLE LEGISLATIVE MENAGERIE

to a realizing sense of their duty in this behalf, I shall feel that I have not lived in vain. Forestry, in its true sense and meaning, as I understand it, consists in the planting, cultivation and management of larger areas of ground than has been attempted; in the rearing of long lines of wind-breaks or belts of forest timber, so arranged as to arrest the force of prevailing winds; in the care, protection and preservation of our native forests, and in encouraging and protecting and assisting nature in the re-habilitation of extensive tracts of original forests that have been destroyed by fire, and where, Phoenix-like, a new crop of young forest trees are springing up from the ashes. In its broadest sense, its scope is larger, but so far as we are practically concerned, this is about the size of it. The development of new forests and the preservation of the native forests in Minnesota are the particular subdivisions of forestry which more nearly concern us. Geographically located as the State of Minnesota is (on the eastern border, and including within her boundaries a portion of that immense interior treeless region which stretches from the southern limit of the Staked plains in Texas to the Saskatchewan, and nearly to Hudson's bay on the north—from Eastern Kansas and Nebraska, Western Iowa and the Big Woods of Minnesota on the east, to the foot hills of the Rocky Mountains on the west—practically taking in 20 degrees of latitude and 10 degrees of longitude—in round numbers covering 1,000,000 square miles, or 640,000,000 acres—enough for 4,000,000 farms of 160 acres each, and room for 20,000,000 of people) the subject under discussion is necessarily one of great local interest to Minnesota, as well as to the nation at large. This vast "interior" region is

PRACTICALLY TREELESS.

The exceptions are portions of the coteaus in the vicinity of the Sisseton reservation, the Black Hills, Turtle mountains, Pembina mountains, and narrow strips and small groves along some of the water courses and lakes—in comparison with the whole, hardly enough to swear by. With such a neighbor adjoining and flanking us in the rear, I have often thought, while traversing the great prairies of Dakota, that, for all practical purposes, she was a part of, or, at the farthest, simply a suburb of Minnesota, and it is extremely difficult for a Minnesotian to discuss forestry without taking cognizance of Dakota as a prominent factor in the solution of our own forestry questions. Not only Dakota, but her adjacent neighbor, Manitoba—the Prairie Province—with the vast outlying prairie region, stretching west and northwest to the feet of the Rockies—all that open region through which the fierce blasts of the polar regions find unobstructed passage, culminating in Minnesota “blizzards;” and in the other direction, the vast prairie arid region of the southwest, whence come the simoon-like winds so withering and antagonistic to growing crops, forest culture and human comfort. All these are factors not to be ignored. They force themselves upon you, as horticulturists, as your most bitter, determined, uncompromising foes; blasting your hopes, destroying at one sweep the results of years of patient toil, confounding your calculations, and every now and then setting you up on your beam ends in the most unexpected manner. The prairie farmer suffers from the same causes to an equal if not greater extent than yourselves, and their misfortunes entail corresponding disasters upon our commercial and manufacturing interests. Now that we have finally settled up our old railroad bonded indebtedness, and on a basis satisfactory to our creditors, the enemies of Minnesota havenothmanget them to harp on but our climate, and even that we can so modify by tree planting, as not only to “temper the wind to the shorn lamb,” but

DISARM OUR ENEMIES

of their last remaining weapon. These elemental forces are undoubtedly all right and play an important part in the economy of nature. We have only to guard against them when on the rampage, and in doing this forestry is the prime factor, the central figure in the whole business. I have neither time or patience to even attempt to answer the puerile arguments and unfounded assertions that trees won't grow on our western prairies. Life is too

short to fool away any portion of it in that direction. Facts, not theories, claim our attention. The fact that within the last ten years hundreds of groves, containing millions of healthy, vigorous young forest trees, are now growing far out in the treeless region where science had preordained and doomed the work an impossibility, must be acknowledged. The fact that young groves of forest trees are now being successfully grown on the line of the Northern Pacific railroad, away out and beyond the 100th meridian, has also got to be admitted, science and its votaries to the contrary notwithstanding.

Where weeds and grass will grow, there also forest trees can grow, and where they grow the more agriculture will succeed, and the better you know how to do your work, the larger the measure of your success. I am assured that I am expected to give a good deal of this sort of knowing how to do it, in a few words as possible. Having written and spoken so much on this matter, and time and again reiterated the same instructions, it seems to me unnecessary to again repeat what has been so often said by myself, but has also frequently been better said by others. Like the thrice told tale, I am sometimes weary with the hearing of it, and when I am asked by apparently intelligent men if trees will really grow out on those great prairies, I feel very much as the preacher did who, after having devoted the best part of his life to the faithful preaching of the gospel, was astonished one day by one of his congregation, asking him if it really was a fact that Christ was dead.

PREPARATION OF THE SOIL.

This is the first thing to do, and is of paramount importance. Unless properly done failure is the rule—success the exception. Get your ground in condition to produce a rattling big corn crop, and you have taken a long step in the right direction. In order to do this, in commencing de novo, break the prairie sod in June. Break it about three inches deep. Be vigilant and careful in this very important preliminary work. See that your breaking plow is a good one. Adjust it so it can't help but do good work. Keep the lay sharp. Draw it out every few "bouts" by hammering. Use your hammer on the lay freely and only use the file for putting on the last touches. Should the ground be at all rocky, put a man with pick and spade to remove the rock ahead of the breaking plow. Should you make a "balk" back up and take it out. In finishing up the "land" don't leave a strip of unbroken prairie from six inches to two feet wide as many do, but clean out your "dead

furrow" so thoroughly that no green grass is visible in it. Having done this much, nature then steps in and the process of the decomposition of the tough prairie sod commences. Usually by the middle of the ensuing August the sod has so far decomposed that you can commence "backsetting." This can be done with your breaking plow unless the gauge wheel prevents the plow from running deep enough. If so, change it for the strongest stirring plow you can get. Commence "backsetting" at the dead-furrow—throwing your furrows in and towards it, and bring up three or four inches of fresh dirt. Simply turning over the sod is of no account, and is worse than useless. It is full as heavy work to "backset" properly as to break, and it costs as much to do it. You have now laid a substantial foundation for success, and it will be good practice to let the ground rest till the following spring, that the action of the elements may step in and aid you in the process of disintegration. Then commence harrowing, and harrow "till you can't rest." By this time, unless it is a peculiarly perverse piece of ground, you have got it pretty thoroughly "bulldozed," and if you are in no urgent hurry to get your trees planted, plant the ground to corn or potatoes, the thorough cultivation of which leaves the ground in excellent condition. If you can't plant to some hoed crop, you can

SOW IT TO SMALL GRAIN,

and in doing this you cannot be too careful in procuring clean seed, for an almost imperceptible amount of "foul stuff" is sure to entail a vast amount of labor in its extermination. After the crop is off, again plow the ground as deep as you can afford to, bringing up more new dirt. There is no possible danger of plowing too deep for forest trees. In this the danger is all the other way—in shallow plowing. If you are not so situated as to cultivate to crop, then summer-fallow the ground to be planted the coming fall or spring.

When to plant is now the question. Either fall or spring, which? Could I predict with any certainty what the weather would be for six months ahead, I could answer this question positively. Without this positive knowledge, the best I can do is to present the "pros" and "cons," leaving you to assume the responsibility to go ahead on your own judgment. If fall planting is preferred, don't begin until the frost has killed the foliage. In our latitude about the first week in October is early enough to commence, and you can keep on planting until the ground freezes up.

If spring planting is preferred, begin as soon as the frost is out deep enough and the ground in good working condition. One year with another, the entire month of May can be devoted to planting forest trees in Minnesota or Dakota. The advantages of fall planting are chiefly in the fact that the ground becomes firmly packed among the roots of the young tree to the exclusion of the air, and that it is in better position to appropriate the moisture resulting from the winter snows and early spring rains, getting thereby such a "send-off" as to enable the young tree to successfully go through a dry spell that would be very damaging, if not fatal, to spring planting. Such dry spells do occasionally prevail all over the Northwest about planting time, and hang on unmercifully. On the other hand, an open winter with frequent or occasional thawing and freezing, occasionally proves fatal to fall planting, the action of frost heaving the fall-planted seedling or cutting nearly or quite out of the ground. Where well rooted young trees are used we overcome this trouble to a great extent by deep planting. While spring planting escapes this danger, it is in bad shape to withstand a protracted drowth, and right there is where fall planting has the inside track. But should your spring planting be followed up by occasional timely showers, the newly planted trees grow right along with great vigor. The tree planter must take his chances. I have for many years planted largely both spring and fall, and my experience does not yet justify me in bringing in a verdict either way. In fact I consider it one of the least important of the many conundrums of forestry.

THE HANDLING OF YOUNG TREES

before planting is an important matter and deserves a passing paragraph. You will not be greatly astonished to learn for a fact that a very large percentage of all the forest trees planted on the Northwestern prairies are practically dead before they are planted. This is especially true of all the evergreens or conifers, and the trouble is aggravated in this, that the inexperienced planter can't always tell a dead tree from a live one, and keeps right on planting stuff only fit for a brush heap. It would seem as if any one could tell a dead cotton-wood seedling from a live one; and as more cottonwoods are being planted than any other variety, I think it best to say that millions of them are gathered every fall before the terminal bud has formed—are packed with all their green foliage in full vigor in tight boxes for shipment, and commence heating at once, and on arrival at their destination are "too dead to skin"—

they are planted, and the victims are naturally discouraged and lose their interest in tree planting because they don't grow. Again, millions of young trees and cuttings, shipped by careful, conscientious men, who know their business, are unaccountably delayed in transit, arriving at destination in a damaged condition. Railroad managers and freight agents ought to make a memorandum of this, 'as the losses occasioned thereby are particularly aggravating, and arouse the most bitter feeling against the railroads. The damage to and total loss of the trees themselves are wholly insignificant in comparison to the losses involved in their delay; for a man can plant damaged trees on his tree claim if he can get them in time, but if they are delayed too long on the railroads, his claim, worth anywhere from \$50 to \$1,500 is in jeopardy for the want of \$30 or \$40 worth of trees which he has bought and paid for, railroad freight included, and he must resort to the most degrading and contemptible artifices to hold his claim. As a railroad employe, and as an independent citizen, and acting in both capacities, it is my duty to call the attention of the proper authorities to the necessity of reform in this behalf.

PLANT DEEP,

and press the loose earth so firmly about the roots as to prevent any cavities, and any circulation of air among the roots. This process also assists in retaining the moisture, and thus lessens the danger from drought. Unless the weather is unusually wet, it is a good practice to make a puddle of mud and water of the consistency of gem-cake batter, into which the roots of the young tree should be thrust. At all times during the planting season, keep on your guard against the withering effects of sun and wind on the roots. Do not permit the least exposure in this direction that can possibly be avoided, and when it comes to evergreens, bear in mind that, owing to the resinous nature of the sap, what an inexperienced man would consider but a very slight exposure is usually fatal. From my own experience in fishing, I am satisfied that a brook trout will live out of water about as long as an evergreen will live with its roots exposed to the sun.

WHAT VARIETIES TO PLANT.

A good general rule is to plant those varieties that are indigenous to your locality, or as near as you can find them. In going from the big woods of Minnesota to the foot hills of the Rocky mountains, one variety after another drops out until our choice is

limited to the cottonwood and box elder. These varieties keep up a very straggling procession clear across the great interior treeless region—in fact, clear across the continent. I am informed on good authority that the hackberry, red cedar, cottonwood and box elder are the only varieties of forest tree that have held their own, and can occasionally be found in nearly every portion of the arid region, all other varieties having played out.

So far as Western Minnesota and Northern Dakota are concerned, I very confidently recommend box-elder, green ash, white willow, cottonwood and elm, as absolutely sure to grow if properly handled. I might also, with nearly the same certainty, recommend the soft maple but for its unfortunate habit of killing down if its first winter out happens to be an open one; but for all that, I find there is a good deal of "come out" to them. With this list you can plant your ten-acre grove on your tree claim with more certainty of satisfactory results than from the planting of any other crop I know of; and, as these varieties grow up and shade the ground, you can gradually introduce more valuable and less hardy varieties, thinning out enough of the original occupants to make room for their new neighbors, leaving enough of the "old settlers" as "nurse trees" to protect the newcomers. In some such manner as this, it is not unreasonable to suppose that nearly all the varieties of timber now found in the Big Woods of Minnesota will eventually be grown successfully all over the great treeless and arid region of the interior, and the Great American Desert, which once figured so conspicuously on our maps, will ultimately become a tradition of the past.

CULTIVATION.

The wonderful results obtained from a comprehensive and thorough cultivation of the human intellect are not more striking and strongly marked than are the results of good cultivation upon the earth and her products. Hence I recommend the most thorough cultivation of the soil from which the young forest is to be evolved, until such time as the growth of the trees prevents further cultivation.

The proper time for cultivation is from the time grass starts until about the 1st of August. By doing this you enable the trees to withstand drouth. Six inches of finely pulverized earth is the best mulch you can get, and a good mulch retains moisture and retards evaporation. In this connection permit me to jump over the traces in further illustration of the effects of cultivation of the soil of the open prairie region between the Big Woods and the foot hills of

the Rocky mountains. In its uncultivated state its normal condition seems one of aridity and sterility. The grass is generally short and scanty except in the low grounds. The sod is hard, and beneath it is still harder and more compact; the whole surface of the country shedding the rainfall better than an average board shanty. In a dry time the surface, under the exposure of hot suns and scorching winds, becomes parched and cracked into innumerable fissures, sometimes and in some localities to an extent that it renders traveling on horseback a dangerous exercise. I have seen large tracts of our own Minnesota prairie in this condition, and of no more apparent value to the casual observer than so many acres of blue sky. Not a tree, bush or shrub within sight. Practically a desert. While the frost is coming out the soil gets somewhat ameliorated, and occasional showers permit the process of breaking the sod. This is the first step in arresting the aridity. The sod soon rots. Then set the plow down as deep as you can navigate it, bringing up to the surface as much fresh dirt as possible. You have now got it where it feels the effect of rainfall. It don't shed rain like a duck's back any longer. Continue the preparation of the soil by repeated and deeper plowings. When you yet somewhere in the neighborhood of ten or twelve inches of mellow ground, stick in the cottonwood and box elder seedlings, also seeds of the green ash and some willow cuttings. Apply the cultivator. Soon the process of

SUBSOILING

commences. Summoning the silent forces of nature the young seedlings and the seeds and cuttings commence the process of subsoiling by thrusting forth innumerable roots. Silently, slowly, surely, yet with irresistible power, they penetrate the soil. They are hunting for food and drink. They are commencing the struggle for existence. At this critical period the intelligent tree planter steps in and assists nature by the cultivation of the surface soil. With this timely assistance the young plants redouble their exertions. The moisture is pumped to their extremities—their circulation is health; they grow both ways—their roots tearing away towards the bowels of the earth with a vigor and energy that puts to shame the best efforts of the most ponderous locomotive engine. From one season to another the subsoiling process goes on; the roots grow larger, longer, and stronger, getting down below the influence of scorching winds and blazing sun. The body and branches shoot up toward the sun, after heat, light, and air. The

overshadowing branches, the deepening soil, the falling leaves, complete the process, and that particular ten acres of God's footstool under the auspices of the congressional timber culture act, stands forth redeemed, regenerated—an "oasis" in the desert. The shadow of a "great rock in a weary land" is nowhere beside it. It compels an involuntary tribute of admiration from the most brutish soul. The beasts of the field and the fowls of the air seek shelter and find solid comfort within its hospitable area. The belated, confused, weary, storm-buffed traveler hails it as a sure landmark from which to take accurate bearings, and in times of exceeding peril a certain refuge and sometimes salvation from death itself. In portions of Western Minnesota there was scarcely a drop of rainfall last season from before harvest until the beginning of winter, and not enough then to amount to anything. The unbroken, uncultivated prairie seemed dried out, and except in springy places,

WHOLLY DESTITUTE OF MOISTURE.

Even the sloughs, which in ordinary times are reservoirs of water, were in some localities so thoroughly dried out that the ground was cracked and split in all directions. Yet in the midst of this seeming aridity the cultivated fields showed no signs of distress—the summer-fallowed soil was moist to within an inch of the surface, and in the young groves of four to six years' growth, the soil was absolutely moist—nearly wet from the surface down. Three hundred miles further out west and north, on the line of the Northern Pacific railway, the conditions were the same. They had more rainfall out there in October and November than in Western Minnesota, but all through August and September, the season of harvesting and threshing, there was scarcely rain enough to wet through a man's shirt sleeves—the uncultivated ground was parched and dry. In backsetting the breaking, which had been done in June for railroad tree planting, we brought up and turned over from five to eight inches of soil that seemed as dry as powder. Prairie fires were running in all directions; this all through the month of August—yet at no time during the season did our young trees grow more rapidly, or present a more healthy, vigorous appearance, than during this season of drought. We had some days out there, then, when it taxed the physical endurance of men and teams to their utmost limits, and I can honestly record it as a fact that our young trees out in Hazen's desert, on and beyond the 100th meridian, that were planted the preceding May—

grown out there from seeds, cuttings and yearling seedlings, within 100 days from date of planting had thrust their roots down into the earth to the depth of two to four feet, pumping their own water—growing like weeds, and laughing to scorn influences that theoretically ought to have destroyed them. In fact, their growth was so rapid I dared not use the cultivator among them enough to keep the weeds down, and even with this precaution their terminal buds delayed their appearance later than usual, but they ripened up in good shape, and have gone into winter quarters in good condition. Although not strictly called for, or in order, I desire to make mention of another fact, because the majority of mankind don't remember much of anything more than a year, and this paper will be a part of the record in the progress of forestry.

The big freeze of May 20, 1882, or thereabouts, extended all over the Northwest—giving them a dose of genuine winter all through Central Iowa—killing down their corn and giving it a backset from which it never fully recovered, had similar disastrous effects on forestry. Millions of young ash and box elder plants, from the seed, planted the preceding fall, were then just fairly out of the ground, and were utterly destroyed. Our earliest planting of box elder and cottonwood yearlings had commenced putting forth leaves. The buds of the white willow cuttings were swollen full, and the white willow hedges of one year's growth and upward were nearly in full foliage. This freeze had no apparent effect on any of the foregoing of one year's and over, except the cottonwood. In our railroad work, I estimate nearly or quite one-fourth of our yearling cottonwoods of the earliest planting were killed, root and branch, by this unexpected freeze. In certain localities in Minnesota, in the central portions of the State, I observed young artificial forests where rows of cottonwoods, ten to twelve feet high, were killed out, root and branch, by this same freeze, the rows of ash, elm, box elder, willow, and other varieties in the same groves escaped unharmed. I have always been a staunch friend of the cottonwood and am yet, and don't propose to go back on it. It is a good friend of ours; but for all that this weak spot in its character should be recorded.

LEGISLATION.

Some of you may deem this a digression. Not so. We are here on business, the vigorous prosecution of which promotes the commonwealth. The machinery of state was constructed for the very end we have in view—the promotion, security and protection of

the commonwealth. Let us call into requisition some portion of this machinery in the protection of our native forests, now being ruthlessly destroyed by fire, in the care and protection of the hundreds of thousands of acres which have been burned over, and are now struggling to again cover and reclothe the charred and denuded surface, such legislation as will prevent the wholesale waste and unnecessary destruction of young and growing timber in our lumbering operations; in such legislation as will abolish and prevent the abuses now perpetrated with impunity under the Timber Culture Act; and also such legislation as will scatter broadcast such practical information on the subject of Forestry among the people on our prairie districts as will enable them not only to accomplish the best results in this direction in the shortest possible time, and with the least expense of labor, time and money, but also such literature as will wake them up, arouse their enthusiasm and create a generous emulation and rivalry for the best results.

Mr. President, our broad, beautiful, fertile prairies, in our own State and for hundreds of miles beyond, are fast filling up with families from all parts of the globe, allured by the glowing publications of the State, the railroad companies, and the public press. Their little board shanties, sod cabins and "dug-outs" already spot tens of thousands of quarter sections far out in

THE ILLIMITABLE WESTERN HORIZON.

They are the pioneers of civilization—the advance guard of that overwhelming wave of emigration that even now is the astonishment of the world. The great mass are poorly equipped for the struggle that awaits them. Fuel and shelter are their primal necessities, without which thousands will be driven back, cursing the agencies which allured them hither. Those men are there not merely to eke out a miserable existence. They are depended on to raise food for the world; to furnish business for the railroads, and revenues for the State. Consequently the State and the railroads are mutually interested in keeping them contented. What better way than to teach and assist them in planting forests and wind-breaks for shelter and fuel, rendering them thereby fully as comfortable as they would be 300 miles further south. Is the State doing her duty in this behalf? Do her representatives take any interest in the matter at all commensurate with its importance? Do you, gentlemen, and does this State university take such interest in this cause as you might do without damaging your prospects for time or eternity?

These questions are pertinent ; possibly impertinent. Here we are revelling among pine slabs and sawdust up to our necks, while 100,000 of our frontier friends are, even at this moment, twisting slough hay and praying Almighty God to keep them from perishing.

WHAT ARE THE RAILROADS DOING ?

Some of them are doing nobly; some are doing just nothing at all. But in the aggregate they are doing far more than the State for the encouragement of tree planting. The men who represent these districts in the legislature are expected by their constituents to lead off in this direction. They have only to do it to secure such cordial support from the older and better settled portions of the State as to make it a success—a success that will crown them with glory far more imperishable than can be gained in senatorial contests. I am informed that in the publication of your transactions you are unwisely limited to a 300 page pamphlet. If this is so, I have already taken up too much space. I have tried to be economical in the use of words—merely touching briefly on the most salient points, a mere skeleton, instead of a well rounded body of facts elaborately illustrated. You need a bigger legislative appropriation, so that a man can take room enough to do justice to his subject without trespassing on the territory the next man needs and is equally entitled to, and big enough to publish and circulate an edition large enough to go around. Such being the case, the other sections of my paper, Ornamental Tree-Planting, must be postponed.

In the discussion following the reading of this paper, Mr. Hodges said: "The green Ash may be distinguished by leaves with smooth edge and smooth under sides. There is in some places and circles a great furore for planting the Black Walnut. It is a tender tree and should only be planted among trees already established, to give it protection.

Col. Stevens. I have known Black Walnut trees growing in Carver, Hennepin and McLeod counties.

Mr. Grimes. The Minnesota river is the natural northern limit of the Black Walnut.

Assistant Secretary Stearns read the following paper:

HISTORY OF THE POTATO AND ITS DISEASES.

BY A. S. JOHNSON, OF CHILI STATION, N. Y.

The potato is a native of the mountainous district of South America. It had been cultivated in America, and its tubers used for food long anterior to the discovery of this country by the Europeans, and is regarded as one of the greatest gifts of America to the old world. It seems to have been first introduced into Europe by the Spaniards, from the neighborhood of Quito, in the beginning of the sixteenth century, and spread from Spain into the Netherlands, Burgundy and Italy; but it was cultivated more as a curiosity than an article of food.

About the year 1587, Sir Walter Raleigh's vessels carried to Europe from his possessions in Virginia, corn, tobacco and potatoes. The potatoes were largely introduced in Ireland and their cultivation encouraged, for it had begun to be believed that they might be used with advantage for feeding cattle and swine, also as food for the poorer classes, in case of famine or a failure of the grain crop. With this idea in mind, the Royal Horticultural Society of England, in 1663, adopted measures for extending its cultivation; soon afterwards Germany, seeing the advantage and success of its use, became interested and in some portions of the country promoted its growth by compulsory regulations. The potato, however, made slow progress, and was not grown much as a field crop until the latter end of the seventeenth century; in fact, the time when large farmers raised only a few bushels a year is yet within the recollection of some still living.

The first varieties grown in the United States were brought from Europe; but no variety then cultivated, would at the present time, be considered fit for the table; and not much effort was made for a number of years to improve it in any respect. The English white and flesh colored are the first varieties of my remembrance. Farmers used to grow about what they thought sufficient for their

own use, and if one fell short he would call upon his neighbor to help him through, as no one thought of selling any, in fact, there was no market for them.

About the year 1837, a prominent agriculturist came through the country with a wagon load of Rohan potatoes, offering to sell them at the till then unheard of price of two shillings a tuber, as no one had ever been able to get that much a bushel. (I would be glad to get one now, even at four times that price.) He gave such fabulous accounts of its productiveness—we had only to cut it to single eyes and grow two to five bushels; and as to quality, we never had anything like it—that my father was induced to buy one. We cut it up as directed and raised from it about one bushel and a half of large rough potatoes. We tried them for the table and sure enough, we had never had anything like them. We offered them to the pigs; it was evident they had never had anything like them, for they came and smelt of them, but refused to eat them. Father said if the hogs would not eat them, he did not want any more of them. It was the first and probably the greatest humbug we ever had in the way of potatoes. But no doubt some good grew out of it, for it set people to thinking and talking about the introduction of other new varieties, and soon the old red potatoes and Merino came in and took its place; and well do I remember when a lad, of sorting out the long Merino potatoes and making rail fences and log houses of them and carrying them in my arms like wood. I have grown them in the past fifteen years, but have never been able to grow any half as long as those seemed to be in my boyhood. Other varieties, such as Neshannock, Blue Pink Eye, Long Pink Eye, Mercer and Mexican, followed in quick succession, a class of potatoes that has never been excelled for table use.

Previous to 1844, the potato had been vigorous, yielding abundantly with little attention, but in that year there were manifest signs of loss of vitality, and the disease known as the rot appeared, nearly destroying the entire crop, and in 1846 and 1847, in consequence of the failure of potatoes, there resulted a terrible famine in Ireland and elsewhere. People became alarmed, fearing a total loss of the crop, and immediately adopted various methods for its preservation. Knowing it to be a law of nature, that any one species of plants cultivated a long period of years on the same ground, however successful at first, will exhaust itself in time, the people of Ireland as also other countries obtained the opinion, that the chief cause of the failure of the potato was the weakening of the plant, resulting from too constant cultivation on the same

land, and continued propagation from tubers alone. No subject connected with agriculture ever more thoroughly engaged the attention of not only agriculturists and scientists, but the whole civilized world. Every experimental farmer, President of Agricultural Society, or College, sought to make himself popular in advancing some new thing for the prevention of the disease. Many of these were tried, among them that of cutting off the tops. My neighbor said to me, "Dr. B., Professor of Agriculture, says that the disease first attacks the vines and if you cut them off the potatoes will not rot." I suggested the trial of one row through the field, but he with more faith than I took his scythe and mowed the tops from the entire crop of two acres. The result was favorable; he had very *fine* potatoes with very few rotten ones, hence he came to the conclusion, that if he had cut them off a little earlier, before the tubers had formed, he would have had no rotten ones.

It might be observed that few of the varieties cultivated up to the time of the appearance of the rot are now to be found; they have been replaced by others.

Conspicuous among those who maintained the theory that the failure of the crops was due to the weakness of the plant, resulting from long cultivation, was the Reverend C. E. Goodrich of Utica, N. Y., who about this time commenced a series of experiments and procured a fresh supply from its native localities in South America. In raising and crossing seedlings there resulted thousands of seedlings. Some of the most excellent varieties were the Early Goodrich, the Harrison and the Garnet Chili. The Early Goodrich was the earliest potato we had ever grown and the Garnet Chili was the parent of Mr. Breese's famous seedlings, which in turn have given us nearly all the varieties that are now attracting so much attention.

Other diseases, such as the curl blight and scab have become common, and all cultivators are more or less familiar with them.

As to the cause and prevention of these diseases incident to the potato, it is not necessary for me to write, as nearly every professor has his dogma and every cultivator his theory, and still it remains obscure.

Many think we are on the verge of an entire failure of the crop, and without doubt we have cause for alarm, when we reflect that only three years ago the farmers of western New York were growing and shipping more than any other section of the Union, and that last season the scarcity was so great that Irish potatoes brought a dollar and a half a bushel in the Rochester market.

In view of the importance of the potato crop; that the loss of it would be felt in every family in the land; I offer for your consideration the following suggestion:

That one principal cause, however combined with other causes, is the exhaustion of the vegetative powers of the plant, from frequent propagation from cuttings.

Let us see if we have any facts to substantiate this.

The first knowledge we have of any disease was in Germany in 1842, when the blight appeared. We have reason to believe that it was the practice to propagate from whole tubers for nearly three hundred years or up to the time of the introduction of the Rohan in 1837, when the practice of cutting to single eyes commenced. When the Rev. Mr. Goodrich introduced his seedlings, he advised cutting to single eyes; and Mr. Breese's King of the Earlies were sold at \$5 a single eye. Seedmen told us to divide the eye, and offered premiums to those who raised the most from a pound of seed. Is not this re-attempted, and is it not the universal practice to-day? It is a fact that in the vegetable as well as the animal kingdom, nature provides the means for its own propagation. In dividing the tuber, using only a portion of the matured food, we necessarily weaken the plant. Weak parents beget weak offspring; and disease attacks the weakest.

If we require further proof, take the history of the Burbank Potato, the latest new variety in the market. When introduced, it seemed as healthy and vigorous as the White Elephant does to-day. Three years ago it showed the first symptoms of disease, weakness; the next season it failed, and as it was more largely planted than any other variety, I attribute the loss of our crop in this State more to its failure than the dry season.

If these facts are established, we have only to resort to the practice of planting the whole tuber, cutting out and rejecting unnecessary eyes. This method, I believe, would soon restore the potato to its normal healthy condition.

The Secretary. I met the writer of this paper at the Western New York Fair, at Rochester, in September last. He was exhibiting one hundred and fifty varieties of potatoes in one collection, all, as I understood it, of his own growing. I think his ideas on the cause of disease in the potato are entitled to serious consideration. His record on White Elephants for 1882—*twenty-eight tubers* to the bushel, and one $3\frac{1}{2}$ pound specimen, is respectfully referred to Wyman Elliot.

Mr. Johnson, in a recent letter, says, in regard to experiments in potato culture, "They are of little value unless conducted for several years. Three years ago I selected a few white Peachblow potatoes, planted as I have described. This season I have noticed for the first time a decided improvement. I select only the strongest hills and plant whole potatoes. I expect to have pedigree stock in three or four years.

President Sias. I have been interested in this paper. Was raising potatoes twenty-five years ago in town adjoining where Mr. Johnson lives, near Rochester, New York. I raised there at one time 100 bushels from one bushel of Breese's Prolific.

Col. Stevens. I dropped potatoes for planting in my boyhood days, 60 years ago, and it was always the practice to cut the tubers for seed.

Mr. Grimes. When I was a boy they did not cut up potatoes for seed. They took medium sized ones and cut out the weakest eyes and then planted the whole tuber. Think it would be best to adopt that plan now if necessary to restore vitality. Have cut for years and have seen no bad effects. I got one pound of Early Rose when that variety was first introduced; planted tubers in hot bed and took sprouts and transplanted like sweet potatoes, and afterwards planted the tubers, and in this way I got six bushels from three small tubers. They are now deteriorating. How shall we bring them up?

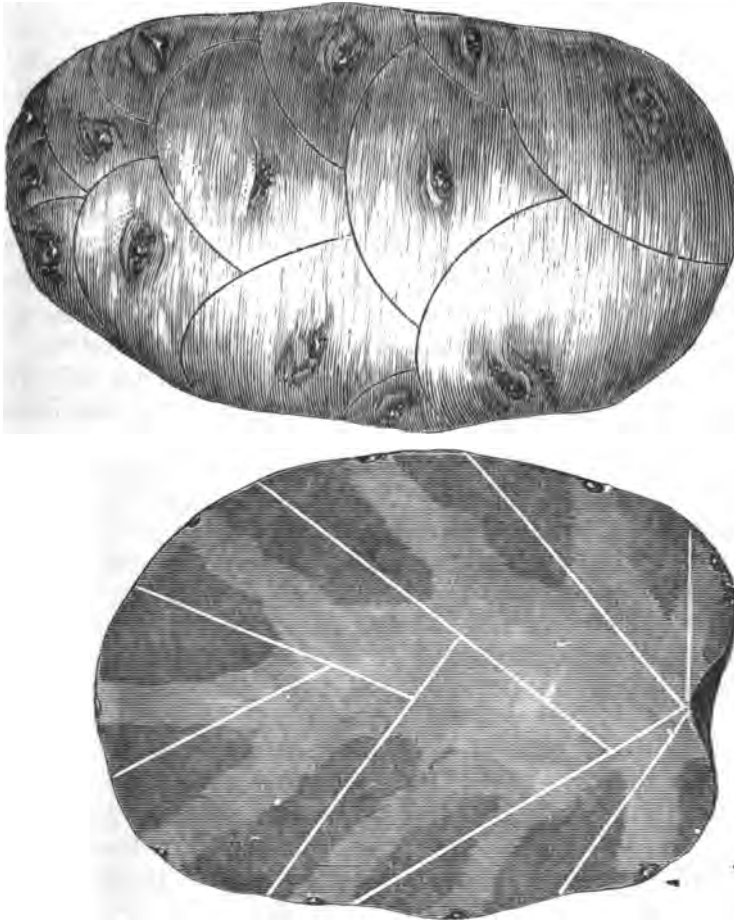
Mr. Pepper. Reproduce them from seed. Cannot see how they should deteriorate by cutting for seed, but by replanting year after year they naturally decline the same as wheat. Early Rose has been running fourteen years, and still yields a good crop if planted on new land. There are ten or twelve eyes in one eye of the potato; only one will start at first, and if that one be taken off and set out others, will follow, and so we can get ten or twelve hills from one eye.

Prof. Daniels. If you plant one eye and put it into rich soil and give it plenty of food, will it not be as well to use a small piece as the whole potato?

Secretary Gibbs. The food of the young potato for a time after the sprout begins to grow is the starch stored up in the tuber, and must be in proportion to the size of the piece you plant. Hence, if the conditions of soil and weather are unfavorable, you may be liable to starve the young sprout in the beginning by planting too small a piece. And there is another fact lately discovered by Prof. Sturtevant, of the New York Experimental Station, that

bears upon this question of cutting the tubers for seeds, and that is that there is a system of roots, imperceptible ordinarily to the naked eye, but discoverable by a chemical process, extending from the eye down to the center of the tuber, and the inference from this discovery is that in cutting for seed you prune these roots too much if you do not cut down to the center of the tuber instead of a lateral cut, as is usually done. Hiram Sibley & Co., seedsmen of Rochester, New York, have a picture in their catalogue this year, showing how to cut a potato with reference to Prof. Sturtevant's discovery, and I will ask them to furnish the cut of it to illustrate this discussion in our next report.

(The cut has been kindly furnished by Messrs. H. S. & Co., and is herewith reprinted).



Mr. Peffer. That is reasonable, and I concur in it. Now about the potato blight. Prof. Budd says when it first appeared it was just as bad on new ground as on that where potatoes had been grown year after year.

Mr. McHenry. I spent last winter in the South. People there get seed from the North and plant in spring; crop matures early, and then they plant again, raising a second crop of inferior potatoes. These they use for seed, and find them better than those of first crop for that purpose. I always cut, but cut to the center. I had no blight this year, while my neighbors, who planted whole potatoes, had plenty of it. I cut to one or two eyes.

PHILLIPS' TREE PROTECTOR.

President Sias. Will Mr. Phillips explain again how he makes his lath protection for fruit trees.

Mr. Phillips explained that it was simply, when done, merely eight lath set up around the tree, held together by a piece of binding-wire woven across each end of the laths, and when put round the tree the sides joined by projecting pieces of the wire. The laths are cut to suit the length of the stem of the tree. You never need to move it till the tree is six or seven years old from the orchard planting, and not then unless it fills up the circle inclosed by the lath. It admits the air, but protects from sun. South side of tree grows as healthy as the north side; it keeps out mice, rabbits, and sap-suckers; and is, in fact, a "daisy." To construct it take a piece of binding wire thirty-eight inches long and twist the ends securely together, making a loop about eighteen inches long, when straightened to its full length. Then fasten two of these loops upon a work bench at the back side at points about thirty inches apart, fastening the loops by the part where the wire is joined and leaving the other ends free and projecting forward toward the front side of the bench. A very convenient way of fastening the loops is to drive a couple of nails into the top of the bench near the back side and then simply drop the loop over the nails, so the nails will prevent the loops from moving forward.

Now take a lath and slip through the loose end of both wire loops and draw the lath forward until both loops are tight, then lift both of the under wires of the loops and place another lath through the loops back of the first lath so as to leave the wires crossed between the lath after the manner of the warp in carpet weaving. Continue this process until eight lath have been inserted and the wires twisted tight up to the last lath and the web is com-

plete. Then place it around the tree, slip the loose end of the wire through the loop where it passes around the first lath inserted, and fasten securely. If the tree branches too low to permit the entire length of lath being used, the ends may be sawed off to the proper length after the web is woven. After the first lath is inserted it is very convenient to fasten it to a spring attached to the front of the bench so as to keep it well forward and the loops properly tightened, and at the same time to permit it to move back as the length of the loop is shortened by the process of weaving.

The Secretary. That, I believe, is the best tree protection yet invented, and is worth the whole cost of this meeting. If I can get a cut made in time for this report I will put it in, representing an apple tree thus protected, the sun looking solemn and baffled, a rabbit near by weeping, a pocket handkerchief held to one eye, and the other eye looking up for condolence to a sap-sucker on a limb, the bird peering down inside the lath where he dare not venture, and a mouse lying dead from fatigue in running around the tree or foraging in some other direction.

SEEDLING APPLES AGAIN.

Mr. Emery. If any good long keeping apples are ever profitably grown in Minnesota it is my opinion they will come from our own resources and not from importations, and they will never get into the hands of the farmers except through the nurserymen. Whenever we find a promising seedling, we propagate it, but slowly at first till we can give it a thorough test. No nurseryman wants to graft 3,000 to 5,000 scions of a new variety till he is thoroughly convinced of its value. I would not shorten the time of the test from ten years in our liberal premium scheme for new hardy keepers.

Col. Stevens. Wyman Elliot sent over to my yard and got scions of Hawkins' Chief and the Boyd apple, and grafted them into Transcendents, and they are now bearing. I do not know of any others of these varieties living.

Mr. Pepper. Stocks for experimental purposes should be grown from the seeds of our hardiest seedling trees. They would be likely to be as hardy as the parent tree, and more so from an accumulated hardiness in the growth of the parent tree transmitted to its seeds.

Mr. Emery. If seed can impart any quality to its progeny it will be hardiness.

FINAL RESOLUTIONS.

Mr. Phillips from the committee on final resolutions read their report as follows :

Mr. President, and Members of the State Horticultural Society:

It is with pleasure that the committee appointed on final resolutions have endeavored to perform their duties, for more than one reason. The committee being residents of localities at some distance from your beautiful city, and two of them being citizens of a sister state, and members of your society, very much appreciate the honor of being called on to return thanks for the kindness and hospitality that has been tendered to the members and visitors at this very interesting meeting of the Minnesota State Horticultural Society, by the citizens of Minneapolis.

We would return our thanks to the railroads which have so kindly reduced their regular fare to encourage the farmers to avail themselves of the instruction to be gained by attending these meetings. They are the Milwaukee and St. Paul, the Chicago and Northwestern, the Chicago, Minneapolis and Omaha, the Minneapolis and St. Louis, and the St. Paul and Duluth roads. We very much appreciate the kindness of those who have so generously opened their doors to receive the delegates and members, and have left nothing undone to make our stay comfortable and pleasant.

Thanks are also due for the kindness and courtesy manifested by the reporters of your papers. We cannot draw these resolutions to a close without saying that we shall always remember the kindness and pains taken by Professor Porter and his gentlemanly assistant, Mr. James Bowen, to make the members comfortable and the meetings interesting, as it is a fact that all could feel at home under their able management. We consider that our meetings have been well attended, and as horticulturists we cannot but feel encouraged in our high and noble calling, and we do hope that every member will return home in the firm determination to try and interest the young men and young ladies to become members, meet with us, and thereby arouse a new interest in horticulture in all its branches, as we consider the advantages to be derived from horticulture in the State of Minnesota are yet in their infancy.

All of which is respectfully submitted.

A. J. PHILLIPS.
GEO. P. PEFFER.
G. W. FULLER.

And on motion the report was unanimously adopted.

Prof. Daniels moved that the executive committee be empowered to employ a traveling lecturer.

Mr. Mendenhall moved that the entire matter of increasing our membership be left to the executive committee, and this motion being seconded by Mr. Elliot, was put and carried.

FOURTH DAY.

EVENING SESSION.

The society met this evening in the room of the Hermean Society of the State University, and spent the time in a general horticultural conference without program.

Mr. Grimes said the society was under obligations to the Hermean Society for placing their room at our disposal for evening sessions, it being better warmed and lighted than any other suitable room for meetings here, and moved a vote of thanks to that society. Motion adopted.

On motion all papers on hand and not read at this meeting were referred to the secretary for publication in the Transactions.

On motion the society then adjourned.

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DEFERRED PAPERS AND REPORTS.

INSECT ENEMIES OF THE STRAWBERRY.

BY R. J. MENDENHALL, OF MINNEAPOLIS.

That the strawberry is the king of berries does not admit of question. Its flavor, its fragrance, its beauty, its diffusion, its hardness and adaptability to various soils and climates combine to render it the berry of berries—the cosmopolite of fruits. The demand for this fruit for canning and other preserves, as well as for use in its fresh state, is increasing year by year, and as a consequence, its production has become one of the most lucrative branches of horticultural business.

The culture of the strawberry is simple and easily learned. It is not a capricious or exacting plant, and yet there is such a large element of uncertainty in its development as to deter many from undertaking it on a paying scale. This uncertainty is not due to the elements. Droughts and winter-killing and even the untimely late spring frosts may be guarded against; but who can tell when or from what quarter to defend the plants from destructive insects? It is to the latter almost solely that failure and discouragement are due.

Our first duty then is to unmask these insidious enemies; to learn what sort of uniform they wear, what weapons they use and at what season of the year they open their attacks upon our *earth* works. It is only by means of accurate knowledge on these points that we can hope to cope with them and obtain an adequate return for labor and capital invested.

To begin with there is the notorious white grub. This greedy and omnivorous feeder has been so often described, both in the larva state and in the equally familiar shape of the May or June beetle (*Lachnosterna quercina*, Knock) that there is no need to dwell on its "points" in this paper. Its work in the strawberry plantation is seldom suspected until it becomes suddenly apparent in the withered and loosened plants which the feeble runners have not sufficient vitality to replace. In those sections of the country where the white grub most abounds, some such result as this may be looked for every third summer. Next to the lawn or meadow, the strawberry bed,—especially where the plants are not confined in rows but allowed to spread freely, affords the May beetle the safest ground in which to place her eggs. To do this she burrows into the earth and lays them among the tender roots on which the little grubs begin to feed as soon as hatched. As they are at first very small and grow rather slowly, their presence will not greatly affect the plants. During their second summer, however, they are very voracious, and by the months of July and August, will have left very few roots to support the plants in the ground. Beneath almost every withered plant will be found the full grown, dirty white grub, to which it owed its destruction. When the strawberry bed has reached this condition there is no remedy but to put in the plow and summon the inhabitants of the poultry yard to "a feast of fat things," at which the robins and several other birds will be sure to assist.

During the past summer there was some complaint by strawberry growers in this vicinity of a little grub or worm which bored into the crown of the plant and through the larger roots. I was not able to get specimens of the perfect insect, but think it will prove to be the strawberry crown borer (*Analcis fragariæ*) first described by Prof. Riley in his third report on the Insects of Missouri.

The parent of this small but mischievous grub is a little beetle of the Curculio family, about one-sixth of an inch long, nearly cylindrical and of an oval form. The color is chestnut brown, with two rather large blackish spots on the outer edge of each wing cover. The thorax is densely covered with minute pit like depressions, and the wing covers with impressed lines. About midsummer this beetle appears in the strawberry beds and deposits its eggs in the crowns of the plants. The grubs upon hatching, bore into the pith of the stem and through the larger roots, causing the plants to decay. The grub changes to pupa within the

stem or larger roots, and the beetle appears during the month of August. It is not yet known with certainty whether it passes the winter in the perfect state or not, but it probably does so, as it appears to be but singly brooded. The remedy is to pull up and burn all infested plants, which are easily distinguished by their weak runners and generally sickly appearance. Large fields it would be best to plow up. It is probable that if the plants after they had done bearing were liberally dusted with Paris green or London purple, diluted with air slacked lime or ashes, the beetle could be kept at a distance, and the destruction of the beds prevented.

In 1872, Mr. Saunders, of London, Ontario, described in the Ent. Society of Ontario, another strawberry root or crown borer, which did considerable damage in certain localities in the province. This proved to be the larva of *Anarsia lineatella*, Zell, a small and inconspicuous dark gray moth of the Tineid family. As this insect has long been known in Europe, it is very likely another of the six-legged immigrants that pay no passage money across the Atlantic and evade the strictest of the custom house and quarantine officers at the entry ports.

The larva when full grown is about half an inch long; it is semi-transparent and of a reddish color with some shining dots scattered over the upper surface. The head is flattened and somewhat heart shaped, of a pale brown color with dark brown mouth parts. Legs and pro-legs dull yellow.

There are two broods of this insect, the second of which passes the winter in the larva state, concealed within the crown or roots of the plant, each worm being further protected by a silken case which it spins before the winter torpor overtakes it.

That this insect has not become by this time a general and serious strawberry pest, is due no doubt, in a great measure, to the increase of parasites, several species of which were bred from it during the years in which it attracted most attention.

The most important of the leaf-feeding insects that attack the strawberry are the Strawberry Leaf Roller (*Phoxopteris fragariae*, Riley) and the Strawberry Slugworm (*Emphytus maculatus*, Norton). The perfect insect of the first named species is a pretty little Tortricid moth, of a reddish-brown color, with the forewings ornamented with streaks and spots of black and white. The body and hind wings are smokey gray. It expands about half an inch.

The larva which does the damage is a small, dull green worm, with conspicuous shining dots scattered over its upper surface

from each of which arises a stiff light hair. Head and top of first joint horny and of a yellowish-brown color.

This worm folds the leaves and gnaws the green tissue from the upper surface, causing them to turn brown and dry up, and where the insect is abundant the strawberry plantations look as though a fire had passed over them.

There are two broods of this leaf-folder in a season, the second of which hibernates in the larva state, protected by the folded and crumpled leaves.

Some years ago this insect was so abundant and its work so disastrous in several of the states immediately to the south of us, as to cause great discouragement to large planters, many of whom in consequence abandoned the culture of the strawberry for market purposes. Of late years, however, its natural enemies have kept it so well in check that it seldom does serious mischief.

The Strawberry Slugworm is the last of the strawberry pests to which I will here call attention. This is the larva of a sawfly and seems to have no other food plant than the one from which it takes its popular name. It occurs throughout the northern and north-western states and Canada. A few specimens may be found during summer in almost every strawberry bed, and occasionally it multiplies to such an extent as to do great damage. It is a smooth, dull, yellow worm, about two-thirds of an inch long, with a large yellow head ornamented with a few dark brown spots. Besides the six true legs, there are a pair of fleshy projections under each joint of the abdomen. It eats numerous round holes in the leaves, and when not feeding rests in a coiled up position. It changes to pupa underground and the fly appears in the following spring. Dusting the plants with white hellibore or lime and ashes is the remedy recommended by gardeners who have had most experience with it.

There are two or three other beetles and several caterpillars that often do some injury to the roots and leaves of the strawberry plant, but as they are only occasional depredators and not in any sense restricted to this plant, it is not necessary for me to dwell on their characteristics in this paper.

REPORT OF E. H. S. DARTT, DELEGATE TO IOWA.

Mr. President and Members :

In accordance with your expressed wish, I attended the meeting of the Iowa Horticultural Society, held at Dubuque. As your representative I was cordially received and made an honorary member.

A very interesting program was presented, consisting of reports from the twelve fruit districts into which the state is divided, interspersed with valuable papers and discussions on various topics.

These reports show a light crop of fruit over the state with a few exceptions, mostly in central and southern sections. The failure is generally attributed to severe frosts late in May.

Fruit lists are revised biennially, and this not being the year for revision, but little was said about varieties.

The Crescent seedling strawberry and the Snyder blackberry seem to be at the head of their respective lists.

Our Wealthy is not much in favor in southern sections, as they have many varieties of equal quality that are better keepers. But towards the north it has warm friends. I heard but one adverse criticism.

In the culture of grapes what is called the pole system had a decided majority of advocates. And spring pruning was not deemed injurious, it being claimed that what is called bleeding is only a flow of clear water and that its escape does no harm.

Under forestry discussions our Scotch pine was regarded as an inferior timber tree, becoming dwarfed and scrubby with age. Prof. Budd mentioned the Rega pine as a suitable substitute. The Catalpa received very favorable consideration.

The matter of off years in the bearing of orchards and the application of manure were quite fully discussed without a very definite settlement of these questions.

Off years seem to be the rule in Iowa, and in nearly every instance where exceptions were noted there had been application of manure either direct or by using the orchard as a feeding lot for stock.

This discussion indicates that while the judicious application of manure to bearing orchards is advisable as tending to produce

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annual crops of fine fruit, yet we should be very cautious about manuring young orchards on naturally rich ground, instances being given where such a course had produced disastrous results.

Prize essays were read on Entomology. That of Mr. Dixon describes the Tortrix, a species of leaf-roller which deposits its eggs on the fruit buds of the apple, and hatches a worm so small as to be scarcely visible to the naked eye, which eats into the fruit germ, frequently destroying an entire crop without the knowledge of the owner. Mr. Dixon sprinkles his trees about the time the buds burst, with a solution of white arsenic at the rate of one pound to 200 gallons of water, with beneficial results.

The people of Iowa, especially in the central and northern portions, are not satisfied with their present list of winter apples, and are looking for improvement in two directions. First, by raising seedlings from best Russian and native varieties, and, second, by direct importations from cold countries of the Old World. The seedling advocates seem to be just a little ahead at the present time, as they had many promising new seedlings on exhibition, whilst, if there were any valuable imported winter varieties, they escaped my notice.

The display of apples was fine, but the gorgeous show of oranges, lemons, and other fruits, with freshly-plucked flowers from the delightful fields of enterprising Riverside, California, was the grand center of attraction. Whilst such things are delightful to behold, and have a strong tendency to soften our frigid hearts towards the "sunny climes," yet it seems unfortunate to those of us who are poor that those crops were produced by irrigation on land valued at from \$200 to \$500 per acre, and that the supply of irrigable land in that section is quite limited, making it absolutely necessary for most of us to seek elsewhere for our haven of rest.

The Iowa plan of dividing the State into fruit districts and electing a director for each, seems to secure so many advantages that I will mention some leading features for your consideration. The President, Vice President, Secretary, Treasurer and twelve directors, form a board for the general supervision of the affairs of the society. (See page 520, Transactions Iowa Horticultural Society, 1881.) Each director seems to have a general supervision over his district—can impart information through the local press, and if a faithful sentinel, will sound the alarm when the insidious fraud enters his domain with his lying tongue, magnifying glass jars of imported fruit and other modern appliances for swindling the

people. This feature alone applied to our State would have saved money enough in the last five years to pay all expenses of our society for twenty years to come.

Directors are required to report for their respective districts to the annual meeting of the society, their necessary expenses in attending that meeting being paid by the society. Thus the practical jurisdiction of the society and its benefits are extended to the most remote corner of the State.

If it is thought that the division of our State into so many districts would prove too expensive, I venture to suggest that perhaps the half of that number may secure nearly equal advantages at half the cost. In the production of these twelve reports there must of necessity be much repetition, and the reading of so many papers in addition to customary essays on other subjects, seems to take so much time that discussion, the great "Elucidator" is too much circumscribed.

Again, the publication of so many papers of similar import will swell the volume of the transactions till with differences of opinion so frequently expressed the tendency will be to confuse rather than instruct. With a much smaller number of papers thoroughly discussed and judiciously pruned, we may present a volume *brief enough to be read and comprehensive enough to be understood*. And I raise the question whether 10,000 copies of such a book in paper covers, placed, in the language of the politician, "where they would do the most good," would not be more beneficial to our people than a volume of 5,000 nicely bound copies of over 500 pages, as annually distributed by Iowa.

By way of compromise can we not have a moderate supply of full reports bound for exchange, etc., and 10,000 copies in greatly condensed form for systematic general distribution?

It was my intention to offer these suggestions in regard to districting our State volumes of transactions, &c., orally, but as I have been honored by re-election which deprives me of that privilege, you will excuse me for occupying so much of your time. And allow me to express the hope that you in your wisdom will adopt and elaborate some plan by which our labors may be extended so as to secure equal favors and equal benefits as fully as possible to every section of our State.

BILLS ALLOWED AND ORDERS DRAWN.

1882.			
December 7,	Secretary's salary, third and fourth quarters.....	\$100 00	
1883.			
January 18.	Balance due Secretary to January 15, 1883.....	25 83	
" "	Prof. Porter, express charges paid for Society.....	4 40	
" "	Treasurer J. T. Grimes, expenses at meeting Ex. Committee, Rochester, Sept. 6, 1882.....	6 85	
" "	U. S. Hollister, secretary's expenses.....	5 85	
" "	H. C. Stearns, services as reporter, annual meeting, 1883	40 00	
" "	J. S. Harris, expense bill as president and member seedling committee.....	7 15	
" "	J. M. Smith, expenses from Green Bay and return.....	25 75	
" 19.	J. T. Grimes, salary as treasurer, 1882.....	25 00	
" "	James Bowen, librarian, appropriated for incidental expenses library.....	*10 00	
" "	O. Gibbs, Jr., appropriated for expenses to Madison and return, as delegate to Wis. Hort. Society.....	*20 00	
" "	Appropriated for secretary's incidental expenses.....	*10 00	

*To be accounted for at next meeting.

MEETING OF THE EXECUTIVE COMMITTEE.

The Executive Committee met at the Metropolitan Hotel, St. Paul, Monday, February 5, 1883, at 10 o'clock A. M., at the call of the chairman. Present, J. M. Underwood, Chairman; Oliver Gibbs Jr., Secretary; J. T. Grimes, Treasurer; O. F. Brand, W. E. Brimhall and M. Pearce.

Business transacted as follows :

The Secretary, Prof. Porter and Mr. Emery, committee on legislation, were requested to wait upon the Governor, and lay before him the invitation received from the American Pomological Society for a display of Minnesota fruits at their biennial session at Philadelphia in September next, for such action as he may deem proper.

The Secretary was instructed to prepare a premium list and program for the summer meeting, June, 1883, on same general plan as that of last year, and send copies to members of the committee for revision, the date of the meeting to be left open late enough to set it at the best time for a strawberry exhibition.

The committee on legislation were instructed to make the most earnest efforts to have the law amended so as to permit the increase of our report to 500 pages, and strike out the limit of \$750 as to cost of the volume.

Missionary work laid out as follows :

O. F. Brand, Faribault ; M. Pearce and J. T. Grimes, Minneapolis ; W. E. Brimhall, St. Paul ; J. S. Harris, La Crescent ; Oliver Gibbs, Jr., Lake City ; A. J. Phillips, West Salem, Wisconsin, and J. M. Underwood, Lake City, to hold themselves in readiness to go out on call of localities to lecture on horticulture and assist in organizing horticultural societies in Minnesota and northwestern Wisconsin, their traveling expenses to be paid by the State Horticultural Society, and local expenses to be paid by societies where they do their work.

EXPERIMENTAL STATIONS.**Superintendents appointed :**

Prof. Edward D. Porter.....	Minneapolis
M. Pearce.....	"
G. W. Fuller.....	Litchfield
A. W. Sias....	Rochester
R. M. Probstfield.....	Moorhead
Jacob Austin	Fergus Falls
J. S. Harris.....	La Crescent
S. Bates & Son.....	Stockton
Underwood & Emery.....	Lake City
O. F. Brand.....	Faribault
J. H. Brown.....	Lac qui Parle
E. H. S. Dart.....	Owatonna

The Chairman and Secretary to frame and publish rules for their management.

BILLS ALLOWED AND ORDERS DRAWN.

E. H. S. Dart, expenses as delegate to Iowa.....	\$17 95
Expenses of Executive Committee for this meeting ..	19 85

PRIZE ESSAYS.

The following essays, offered in competition for the society's prize of twenty-five dollars for the best essay on orcharding in Minnesota, having been referred to the committee of award, were returned to the Secretary on the 2d of March, with instructions to print them, and with the information that the committee would defer the award until after the appearance of the essays in the report.

ORCHARDING IN MINNESOTA.

By R. P. SPEER, OF CEDAR FALLS, IOWA.

When I reflect for a moment that our climate is remarkably severe; that our soils are not adapted to the growth of fruit trees, and that it is only a few years since Minnesota and northern Iowa were occupied exclusively by the Indians and wild beasts, I am not surprised at the great number of our failures, but at our successes in fruit culture.

Although we cannot grow the varieties of the different kinds of fruits which are valued most highly in many of the other States, yet a sufficient number of varieties of the apple, grape, etc., have proved healthy and productive after our severest winters, to dispel all doubts in regard to what may be accomplished by the "breeding" of seedling fruits intelligently upon a large scale, or by the impor-

tation of hardy varieties from parts of Russia, where the climate and soils are similar to our own. But the rate of advancement which we will make in fruit culture, will depend more upon skillful selections of soils and the adoption of proper methods of orchard management than the introduction of very hardy varieties of fruits. We must ignore the directions given in the standard books for pruning, planting, etc., and be guided by the results of experiments made on our own bleak prairies. My principal reasons for valuing the experience of western fruit growers so highly, may be inferred from the following report of things which I have learned while trying to grow an orchard in northern Iowa.

The health and productiveness of fruit trees depend as much upon the qualities of the soils upon which they have been planted as upon climate or culture. Loamy soils, consisting of sand, clay, and vegetable mould in nearly equal parts, are best for orchards. The best subsoil is yellow clay, which contains sufficient sand to render it porous, and it should be thoroughly drained. Some good orchard soils are naturally well drained, while others are not.

For the benefit of those who do not appreciate the advantages of drainage, or understand why some soils are suitable for orchards and others are not, I will give some of the reasons why the presence of too much or too little water in a soil, is injurious to growing plants or trees. Plants cannot grow without the presence of atmospheric air and moisture in the soil. Stagnant water in a soil will not only exclude atmospheric air, but will cause the particles of which it consists to adhere so closely together that it will be liable to bake when it shall become dry. In the latter case it would be almost as impervious to atmospheric air as when filled with water. Therefore two of the leading causes why fruit trees will not grow on wet soils will be apparent. Too many farmers and fruit growers are ignorant of the fact, that a very large part of the food which plants and trees require exists in the atmosphere in the form of gases, which are carried to their roots in porous or drained soils by rains; or, during clear weather, by the condensation of the moisture of the atmosphere in the soil. But when a soil is badly baked or filled with water, neither rains nor atmospheric air can enter it, and the benefits to be derived from these important gases are lost. Again, the roots of trees cannot use or take up food which is not in a liquid condition. But only a part of the substances upon which plants feed are soluble in water, while others are made so only by the aid of carbonic acid

and other gases which exist in the atmosphere. And (as we have shown before) as atmospheric air cannot penetrate an undrained soil which is badly baked or filled with water, therefore fruit trees which grow on such soils would be partially starved, because they must necessarily be deprived of all of the inorganic plant food which is not soluble in water.

In dry seasons the soil is supplied with moisture in two ways, to wit: by capillary attraction and condensation of moisture from the atmosphere. By capillary attraction it rises from the sub-soil upon the principle that water rises in an empty sponge or lump of sugar. In the summer much water exists in the atmosphere, and is held in the form of vapor by heat. This vapor can only be changed to water by coming in contact with something which is cold enough to condense it. When a hard, compact soil has been plowed only four or five inches deep, but little atmospheric air can penetrate deeper than the bottom of the furrows, and during the season of growth the mellow soil near the surface is too warm to condense the vapor which the atmosphere contains. But when a soil has been stirred to the depth of ten inches and contains no stagnant water, atmospheric air will circulate freely to the bottom of the furrows, and as the lower part of the stirred soil is shaded by that which is more elevated, it will be rendered sufficiently cold to condense the vapor from the atmosphere. When the subsoil of an orchard consists of blue clay, or other matter which is impervious to water, but little moisture can be furnished by capillary attraction for the use of trees during times of drouth, as but little exists in such subsoils. In such instances, if we would prevent the moisture in the atmosphere from being condensed in the soil by shallow plowing or improper culture, our fruit trees must necessarily starve. Very sandy soils are unsuitable for orchards, because they lose water and plant food rapidly by leaching, and because the roots of trees in them are more liable to be killed by cold than in soils which contain more clay and retain more moisture. Therefore, as orchard soils should be ever moist and yet never contain stagnant water, it will be readily seen that unusual care is necessary in the selection of orchard sites.

The greatest losses in the orchards through all parts of the Northwest, have occurred after protracted late summer, or autumn drouths, which were followed by severe winters. The fatal effects of the winter of 1872-3 will not be forgotten soon by a majority of those who had promising orchards in northern Iowa and Minnesota. During the summer of 1873 I examined the roots of the

trees in many orchards. On very dry ground I invariably found them killed or severely injured, while on moist ground they proved to be sound. In my nursery on high, dry ground, I had several acres of dead trees, while on heavier, moist ground I sustained no loss. On the north sides of buildings and high board fences, I have always found the soil more moist and fruit trees in a more healthy condition, than when on the south sides, or other places more exposed to the sun. Northern slopes are better for orchards than southern slopes, because they remain moist longer during times of drouth than the latter. Heavy break-winds near orchards do more harm than good. I have known apples to be badly scabbed on the east sides of such break-winds at different times by severe late spring frosts, while in other parts of the orchards they were not injured. At such times they intercept the passage of light west winds which prevent harm in orchards more exposed. Light break-winds of evergreen trees are desirable. But cottonwoods, white maple and willow are unsuitable for such purposes, as the remarkable absorbing qualities of their roots and the reflection of the heat of the sun by their light colored leaves causes the ground to be sufficiently parched during our hot summers, to greatly injure or ruin the fruit trees which stand near them. In Minnesota there is a great variety of soils and subsoils on nearly every farm, and most of them contain too little of the inorganic mineral substances which fruit trees require. While selecting our orchard sites, we should look less to convenience than natural drainage, and the qualities of the soil and subsoil which will render them least likely to be affected by drouth. It is unsafe to plant many trees of varieties which have been tested in only a few localities. Whether fruit trees should be planted much deeper than they stood in the nursery or not, will depend on the qualities of the soil and subsoil. Where only light or sandy soils can be used, the collars of the trees should be placed twelve or more inches below the surface of the ground, for the purpose of aiding their roots to reach permanent moisture. Where the ground is inclined to be too wet, or bake during very dry weather, it should be well ridged up for the rows of trees, and shallow planting will prove best. On good orchard soils which have porous subsoils, trees should not be planted more than two inches deeper than on a wet soil. Too many fruit growers forget that nature's methods are invariably the best, and rely more on plausible theories than common sense. We have been told repeatedly that deep planting is best on all soils, because it will prevent the roots of trees from be-

ing killed by cold, and cause each of them to throw out an additional set of valuable roots above its collar. To the first proposed advantage to be gained by deep planting, I will reply, that I have never known the roots of fruit trees to be injured in a good moist soil which had received proper care. In regard to the forcing of trees to make additional roots, I will answer, that in natural forests, most varieties of trees grow upon soils which are adapted to their wants; that the junction of the main roots and body of each tree is at or near the surface of the ground; that each tree has but one set of main roots, and that the diameter and length of each root is in proportion to the size of the trunk and height or diameter of the top of the tree to which it is attached. The forcing of trees to double the number of their roots by deep planting, would relieve each root from doing more than half of its natural share of work, and in the course of time, both the natural and forced roots would be dwarfed to half the size and length of the roots of properly planted trees. No one will doubt this statement who has had much experience in transplanting cabbage and tomato plants, or evergreen trees, etc. What we need most on our deep prairie soils is very long roots which will reach well down into the subsoil, instead of great numbers of roots. Almost any crop which requires good cultivation is suitable for orchards until they begin to bear fruit. Afterwards for several years no other crop will prove better than buckwheat, which should be sowed during the latter part of May. But why buckwheat is a better crop for orchards than wheat, oats, timothy, etc., may require some explanation. On our best orchard soils we can furnish all of the moisture which our trees will require by growing suitable crops, or by mulching. Buckwheat is a suitable crop, because a single experiment with a thermometer in a field of buckwheat will show, that the temperature of the air which circulates among its stalks is much lower than the temperature of the air above it. A similar experiment in a field of oats, wheat, rye or timothy will show that the temperature of the air near the ground in either of such fields, is much higher than that which is above the tops of the growing crops. In a field of buckwheat the soil is cold enough to condense the moisture of the atmosphere, consequently it cannot be otherwise than moist. In a field of wheat, oats or other similar crops, the soil is always dry in dry weather, because it is too warm to condense the vapor which is in the atmosphere, and its heated condition causes what moisture it does contain to be evaporated rapidly.

The condensing qualities of clover are similar, but not equal to those of buckwheat. The experience of the most successful fruit growers proves that it is absolutely necessary that the ground in orchards should be shaded by something during the growing seasons. Therefore they should never be used as pastures, as the eating of the grass or clover by animals would expose the surface of the ground to the sun. Clover should follow buckwheat as an orchard crop, but where it cannot be successfully grown, other hardy kinds of grass may be used instead of it. Neither buckwheat, clover, nor grass should be removed from orchards. When such crops shall become sufficiently matured, they should be cut and allowed to remain on the ground as a mulch. Bearing orchards which have been seeded to grass should have a liberal top-dressing of well-rotted manure every three or four years. In many places fruit growers resort to pruning at certain seasons of the year to reduce the vitality of trees and render them fruitful. In moist climates like that of England, trees require pruning for the purpose of letting light and air into their tops. But it is unsafe to reduce the vitality of trees on account of the severity of our winters, and the remarkable dryness of our climate renders it unnecessary to make their tops more open. In fact, our trees require no pruning, except to give them the required shape and keep them in proper shape afterwards. When it shall become necessary to prune, the operation should be performed immediately after the buds have opened into leaf in the spring. If the work should be done then, the wounds will be more likely to heal before winter than wounds made later. In places where the atmosphere is more moist, large limbs may be removed from trees in June, or later, without danger of injury, but by exposing the bare wood of trees to the winds during winter in Minnesota would invariably cause them to become "black-hearted." Our fruit trees have been seriously injured very frequently by a cause which has received but little attention. In bearing orchards nearly all of the trees lean more or less to the northeast, and the bodies of those which lean most are generally badly scabbed or rotten on their southwest sides. About the tenth day of April, 1880, I examined the different varieties of trees in my orchard and nursery carefully, and found them in a healthy condition. Four days later, when they were full of liquid sap and their buds were beginning to open, the mercury stood for hours at from 85° to 90° in the sun. In about a week afterwards I examined my orchard and nursery trees again, and found the

inner bark on the southwest sides of nearly all the trees more or less injured. By the middle of May the bark was dead on the southwest sides of my Wealthy apple trees in the orchard. I have noticed similar spells of weather at other times, after the sap of the trees had become liquid and before their buds had opened into leaf. In fact it is not unusual in northern Iowa and Minnesota to have only a few hours of spring weather between winter and summer. In sections of the country where fruit trees have proved most healthy, the change from winter to summer is more gradual. That trees must necessarily be severely injured at such times by such sudden changes of temperature, is very evident to persons who are well informed in regard to the principles of plant growth. When the buds begin to open into leaf, the starch, sugar and other reserve food materials which have been stored in the cells of trees during winter, are in a liquid condition—in fact the trees are full of thin, watery sap. As there are no leaves on the trees at such times, there can be no upward flow of sap. And being stationary when the temperature of the atmosphere ranges between 75° and 85°, it will be many degrees hotter than the sap of healthy trees during the hottest days of summer. At such times chemical changes take place which were not intended by nature. The tender inner bark will be not only scalded but poisoned, and the result will be dead bark, and afterwards dead wood. While considering this question, we should not forget that during growth the sap of trees is "pumped up" from the ground by their leaves, and that if they should be removed it would become stationary immediately. As evidence of the fact that the upward flow of sap is rapid and that its temperature is low (as most of it comes from the cold subsoil), I will remark that it has been proved by many experiments made by skillful scientists, that the upward pressure of sap in healthy fruit trees and grapevines is from five to seven times greater than the pressure of the blood in the arteries of dogs.

To protect the bodies of trees from being scalded in the spring, I cannot recommend anything better than protection by boards or paper, or by winding hay or straw bands around them. As I do not wish to become wearisome, I will only add to what I have said, that healthy trees of such varieties as Duchess of Oldenburg, Wealthy and Plumb's cider were never seriously injured by cold in Minnesota, and that apples will be plentiful and cheap in all parts of the northwestern states, when we shall have learned how to get our fruit trees into winter in good condition, and how to get them safely out of it.

*ESSAY ON THE MANAGEMENT OF ORCHARDS IN
MINNESOTA.*

BY A. J. PHILLIPS, OF WEST SALEM MASS.

Had I written an essay on the above named subject ten years ago, I would have examined the reports of your State society and those of other societies where latitude and other surroundings were similar, and would have prepared a paper for your consideration, made up of the condensed opinions and experiences of the most practical nurserymen and orchardists. And I entertain no doubt that it would appear before you clothed in better language, arranged in a better manner, and be a much more interesting document to be read in your hearing, and discussed by the members of the Minnesota State Horticultural Society, than the one now before you. By way of introduction, will say I propose to give you a paper on the subject as given in the title—on Minnesota and latitudes similar, as I have learned it from twelve years constant experience and hard work in the business; and for the purpose of this essay will give you no Latin or foreign phrases, but endeavor to write it in plain English, so that every man who contemplates plating an orchard in Minnesota, and in localities similar, can understand it, and I hope, treasure up some suggestions from it that may prove a benefit to him in his future efforts to raise fruit in this climate, which cannot be done without firm determination and the exercise of the greatest care. In the different items which contribute to make up the orchard, the apple being by far the most important fruit, and the leading inquiry among planters being where, what, and how to plant, cultivate and market, I will devote this essay mainly to the inquiries respecting an apple orchard. I cannot of course in the length of an ordinary essay, attempt a thorough treatise on all the foregoing points, but will give you in as short, plain and concise a manner as possible, the experiences and practices that have come under my immediate observation. The first item that suggests itself, is the selection of a site for the orchard, which includes several important factors, such as altitude and locality, as regards bodies of water, also exposure.

First on the list to be chosen is a site near a body of water, of sufficient size to modify the extreme changes to which this climate is subject. But this cannot be chosen by many. Second is a site on as high land as possible, not too steep to be worked easily, and the fruit gathered without trouble. Then choose first an eastern or northeastern exposure; using the south and southwest as the last choice. I make this last statement for the reason that I consider the greatest hardships our trees have to encounter, and the most permanent injuries they sustain are those caused by the hot rays of the sun in early spring, causing the sap to flow before cold weather has ceased, and producing more evaporation than the forces of the tree are able to withstand after one of our cold winters. We know that in order to mature our crops in the short seasons in this latitude, very hot weather is a necessity, and as the sun lingers later in the south and southwest, are my reasons for saying it is the most unfavorable site. I think if the sun shines hot in early spring, causing the sap to flow and producing great evaporation, and afterward freezes hard, it affects the tree in the same manner, or on the same principle that a man or horse will suffer injury from a sudden change to cold weather while in a state of warmth or perspiration.

Knowing as I do that trees prosper and grow better in any other exposure than the one last described, still I say, other things being equal, you can by using proper care grow trees and fruit on any exposure.

Next in order comes protection, a point on which I am well aware that doctors and experienced tree planters disagree. First, I will say if you have timber on the north and northwest, the source of our prevailing cold winds, do not cut it away on purpose to expose your orchard to the chilling blasts. Neither would I recommend planting the orchard too near the timber; say not nearer than twenty or thirty rods, for the reason I believe the growing orchard needs a full and free circulation of air, to grow fine fruit and protect it from the ravages of insects which abound much more in thickly-planted and protected orchards than others. Next, timber and under brush affords a hiding place for rabbits and mice, which do so much mischief to the orchard when the ground is covered with snow; on the other hand, if you have no timber protection, plant a row of Miner plums fifteen feet apart on the north side of the orchard, and a row of DeSoto plum trees on the west side, the same distance apart, then plant your hardiest trees next to these rows, and scatter through the orchard an occasional Scotch pine or Norway spruce for ornament and to soften

ESSAY ON THE MANAGEMENT OF MINNESOTA.

BY A. J. PHILLIPS, OF W

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being the excessive growth which continues late in the season,
causing the extremities of the limbs to start into winter in a tender
condition, it is in my opinion one of the finest and most particu-
lar points in managing an orchard in this climate, that there must
be sufficient enrichment and cultivation of the soil to cause a full
healthy growth of good wood, and care exercised to avoid excess,
thereby causing a growth of immature wood incapable of withstand-
ing the severities of the seasons. Good wood is necessary for the
production of full crops of good fruit, and such wood will be able
to endure our coldest winters and warmest springs and summers ;
and right here let me say if your location is such that you are com-

STATE HORTICULTURAL SOCIETY.
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 y-four to thirty feet apart according to the habit of the trees.
 This affords some drainage which is all important. But a thor-
 ough system of tile draining is much to be preferred. Of course
 this is attended with trouble and expense, but in most soils it will
 pay well for the outlay, and in many places on it depends much of
 the success of the orchard. But while tile draining is preferable,
 you will find good surface draining much better than none. In
 short, the better you prepare the soil and the more care you exer-
 cise in watching and controlling the growth of your trees in this
 trying climate, the better you will be satisfied with the appearance
 and profit of your orchard; ever bearing in mind that care and
 vigilance is the price that orchardists in this latitude have to pay
 to insure success.

Your ground being prepared in accordance with the foregoing
 directions, next in order comes the selection of varieties to plant,
 and now comes by far the most important factor in the usefulness
 and profit of the orchard. And you must bear with me if I spend
 some time on this topic, as this will tend in a great measure to
 recommend or condemn it in years to come. Our first aim must
 be to select those that with good care and culture are seldom in-
 jured by the vicissitudes of climate, and in order to do this in this

and modify the breezes. This I consider all the timber protection that is needed. Still a wind-break of suitable timber planted twenty or thirty rods away on the north and west I would not consider an objection to the prosperity and usefulness of the orchard. Next in order we will consider soil, which I consider by far the most important point in the selection of the site, not only for the success but for the longevity of the orchard. First and best of all is a clay soil, underlaid with limestone. Such soil is generally porous enough to afford good drainage. It is generally impregnated with magnesia, and contains all the best elements of tree growth, which is abundantly proven by heavy and excessive fruiting. Mark, if you never have, the great difference in the yields of fruit on trees of the same varieties, same age and size, the one on such soil as I have described and the other on our common prairie soil. The former will produce double, other things being equal, one soil producing fruit and the other being adapted to the growth of wood. The difference in the quality of the fruit is as great as in the quantity. This you will discover if you examine the fruit on exhibition at your winter meetings and at the fall fairs. Perhaps I am using more time in giving reasons than I should, but my object is to make it plain, and you to judge if my reasons are well founded. My second choice would be heavy clay soil that formerly produced a growth of white and black oak timber, underlaid or mixed with gravel or hard stones of the flint, boulder or shale formations. Next, my choice would be a heavy clay soil, without stone; next, a light clay soil, and my next choice would be our common prairie soil, and last and poorest of all, a sandy soil with or without sand rock, always bearing in mind that the natural formation is much better for the orchard than the deposit or alluvial soil. The great drawback with the last mentioned formation being the excessive growth which continues late in the season, causing the extremities of the limbs to start into winter in a tender condition, it is in my opinion one of the finest and most particular points in managing an orchard in this climate, that there must be sufficient enrichment and cultivation of the soil to cause a full healthy growth of good wood, and care exercised to avoid excess, thereby causing a growth of immature wood incapable of withstanding the severities of the seasons. Good wood is necessary for the production of full crops of good fruit, and such wood will be able to endure our coldest winters and warmest springs and summers; and right here let me say if your location is such that you are com-

pelled to choose the last mentioned rich soil or formation for your orchard site, your chances for fruit growing or orcharding in Minnesota are not flattering, and my advice would be to set only a small orchard and watch carefully that the growth is not excessive. You may be obliged, to obtain the desired result, to draw in some soil obtained on some natural formation that will tend to retard the growth; in other words suiting the treatment to the circumstances and conditions surrounding your orchard. Next in order comes the preparation of the soil which should be thoroughly subdued, deeply cultivated and well pulverized before planting the trees, as I firmly believe that while a certain portion of the roots are running near the surface, seeking nourishment sufficient for the growth of the tree, and perfecting its fruit, there is another portion that run down in the deep soil to find moisture and obtain a firm hold in the ground to hold the tree in its place, away from danger of the extremes of heat and cold. Therefore I advise digging deep holes and filling with soft dirt to enable the roots to penetrate. My plan now is to lay out in lands running the way the land inclines, then plow a back furrow for every row of trees, finishing in the middle with a shallow ditch. Have these lands run north and south if possible, so as to have the rows from twenty-four to thirty feet apart according to the habit of the trees. This affords some drainage which is all important. But a thorough system of tile draining is much to be preferred. Of course this is attended with trouble and expense, but in most soils it will pay well for the outlay, and in many places on it depends much of the success of the orchard. But while tile draining is preferable, you will find good surface draining much better than none. In short, the better you prepare the soil and the more care you exercise in watching and controlling the growth of your trees in this trying climate, the better you will be satisfied with the appearance and profit of your orchard; ever bearing in mind that care and vigilance is the price that orchardists in this latitude have to pay to insure success.

Your ground being prepared in accordance with the foregoing directions, next in order comes the selection of varieties to plant, and now comes by far the most important factor in the usefulness and profit of the orchard. And you must bear with me if I spend some time on this topic, as this will tend in a great measure to recommend or condemn it in years to come. Our first aim must be to select those that with good care and culture are seldom injured by the vicissitudes of climate, and in order to do this in this

climate, we must look to those whose lots are cast with us for information. I mean to those who are and have for years been experimenting with trees in this latitude, for the reason that the horticulturist south or east of us has not the practical experience on this point that will rightly guide us. I have learned the foregoing by experience, and in some cases have paid dearly for it, but offer it to others in view of the old saying that our lamp burns no less bright because others profit by its light. The first thing I advise you to do, if you have faith you can grow an orchard and raise fruit, and intend to do it, is to begin to post yourself on this point by visiting orchards and nurseries at least a year before you plant, both in the spring and in the fruiting season. Examine the trees carefully, and note these particular points: first, the general appearance as to hardiness; second, the length of time they have been growing, how many very hard winters there have been during that time, their qualities as to bearing fruit, and its value for market and home use, which are judged by quality and season. Now, the foregoing is based on the supposition that you have access in a reasonable distance to a growing orchard. If such is not the case, you will then have to depend for this information on some practical orchardist, giving him a description of your soil, exposures, etc. Trust not to the tree peddler for this, as nine times out of ten you will be deceived, for though he may be honest, he is not posted himself. And I do claim before he starts on that mission he should take pains and spend time to learn his business where he intends operating, just as much as the doctor, preacher, or teacher, have to learn what is required of them to be successful. The selection of varieties resolves itself into this: select those that are doing the best, and proving most profitable in locations similar to your own. And perhaps right here it would be well to name a few to form the basis of an orchard, as I would set it in Minnesota. Now, in speaking of protection I advise setting a row of plum trees on the north and west, which will furnish plums enough for all practical purposes. Now, I would continue that row around by setting Whitney's No. 20 on the south and east, except ten trees on the east, which should be Tetofski. This row I would head four and one-half feet high, and in five years they will be of sufficient size to support four wires—the best fence in the word to protect your orchard. As apple or other fruit trees, cattle and horses do not thrive well in the same enclosure. Set a good post every twenty rods to strain the wire on; put the staples through a board standing upright; clinch them and fasten to the

ns of inch and a-half screws at top and bottom, loosen-
once or twice each year to allow the tree to grow in
e. This will not only be useful, but will be orna-
hard. These, according to the size of the orchard,
ay, should be no larger than you are able and will-
and care for well, I would set as follows: One-quarter
althy, one-quarter with the very best Minnesota and
ern Wisconsin winter seedlings that can be found by read-
s, attending horticultural meetings, observation, and communi-
cating with practical fruit men. The other half I would set with
Duchess and a few of the best crabs I could find—say one-fourth—
and the balance to be selected as I have directed, say of those that
are doing best in localities similar to your own. I say a few crabs,
as I hold it to be poor economy to set and grow small crabs
when Wealthy and other valuable varieties can be grown as
cheaply and are worth much more. Bearing in mind to confine
your planting only to a few varieties, ever remembering that
it is poor economy and detrimental to the orchard to buy cheap,
poor trees. Buy good ones, with good roots, and don't expect to
buy such a tree for less than twenty-five to forty cents each.
Make it the first point to deal with reliable, practical nurserymen,
for such can be easily found. Now, before care and cultivation
can be bestowed, we must consider the all important matter
of buying and planting further. Buy trees not under two nor over
four years old. Have them dug in the fall; have it done at or near
the time they shed their leaves. Not too early before the forces
of the tree have perfected its growth; neither so late as to
endanger the roots by freezing. Bury them root and branch
in the ground in a place where the water will run off and not go
into the hole with the trees. Bury the roots about one foot deep,
and the tops as shallow as you can, which will place them in about
the proper position. Be very careful that you leave no holes that
mice can enter to girdle and destroy your trees in the winter.
Examine thoroughly about the time the ground freezes. After
that take a load of horse stable manure and place over the mound,
taking it off soon as it begins to thaw in the spring. When warm
weather comes and the frost is out of the ground, take the trees
out, wash them, root and branch, thoroughly, and stand them in
the ground in an upright position, and as soon as you discover the
buds beginning to swell, and before the leaves start, take the trees
out, about ten or fifteen at time. Trim the ends of roots, cutting
from the under side. Carry an old blanket with you to protect

the roots from the rays of the sun while setting them. If the soil is poor, scrape in plenty surface dirt around the roots. Get down and place it in with your hands, taking pains that no spaces are left under the tree for dead air to dry up its forces before the rootlets take hold of the ground. Don't tramp or pack the dirt too solid, and place the roots in as near the same position as they were in the nursery as possible. Set from one to three inches deeper than they stood in the nursery. Not more, as the roots must and will come to the surface for nourishment. In setting, use no water unless the ground is very dry. Then use two pails for each tree; one in the hole around the roots, and one on the mulching after the tree is set. Do not leave the dirt around the tree in the form of a basin to hold water. Mulch as soon as possible after setting with coarse manure, bagasse, or any material that will hold moisture and prevent evaporation. Flat stones are excellent. See that the mulching remains about the trees through the first season; after that I do not recommend it until the grass needs subduing and the tree needs nourishment to perfect its fruit, for I prefer to grow a tree slow in this climate. If your tree has good roots do not mutilate the top by cutting it back, but trim it in proper shape, forming the head about three and one-half to four feet from the ground, and if your tree does not have roots that will support and sustain it you had better throw it away, as in this climate it will not pay to start with a stunted tree no more than to try to raise profitably a stunted animal. Set your trees on the ridges running north and south, before mentioned, and twenty feet apart in the row. I would go further right here and say if you are setting your trees in sandy or very alluvial soil, do not set a large orchard, but go to the nearest place you can get some firm clay soil and draw a good load for every ten trees, and place it about the roots of each tree, and it will pay a good per cent. of the cost in its future usefulness.

Now, having planted your orchard, you should raise in it for the next four seasons at least, hoed crops of some kind, such as corn, potatoes or beans; and when the trees begin to bear, then seed to clover, as its roots run deep and do not interfere with the tree roots, being particular after seeding to mulch at least once in two years to prevent the grass growing close or under the tree to take the strength from the soil which rightfully belongs to it, as no tree can produce an annual crop of fruit while the soil around it is producing a crop of grass. When planting, set a good oak stake on the northwest side to support it if it inclines to grow crooked

and to keep it in a proper position until the rootlets have obtained a firm hold in the ground, so that winds cannot move it. Next, get some common binder wire, cut it in pieces thirty-eight inches long, double it, fastening the ends together. Then take two of these pieces, place them across a work-bench about two feet apart, then take eight pieces of lath and weave them into the wire similar to carpet weaving, cut the lath the length that your tree is headed from the ground; stand the lath around the tree, fastening the ends of wires together and making it fast to the stake until the tree is of sufficient size to support it. This forms a complete circle around the tree and forms the cheapest and most perfect protection against the sun, rabbits, mice and other animals; also sap-suckers, one of the greatest pests among the birds. It also forms a partial guard for whiffletrees, which should be made with pieces of old tugs and hooks attached, bolted on the back side of the whiffletree, so they will not scratch or bark the tree if they do touch it. The trees will grow so as to fill the lath boxes full in six years, then they can be removed and used for young trees again, as the others will need no further protection except care. These will cost put on about six cents each, or one cent for each year of protection until the tree is large enough to bear. These can be made in winter and on stormy days. If you do not take interest enough in your trees to thus provide for their safety, the next best thing I can advise you to do is to go through the orchard in the fall before it freezes and place some dirt around each tree near the root. This will protect against mice, and a man can fix from three to four hundred in a day. Blood rubbed on the tree will keep rabbits away, but I think is of no benefit to it. Protect against other animals as well as hired men as best you can, but be sure and take some pains after you have been to the trouble and expense of setting the trees. Next, if you are exercising a watchful care over your orchard, you will discover that some pruning needs doing, ever bearing in mind the saying that to spare the knife saves the tree in this climate. Shape the top of the tree by cutting out the small limbs, and avoid if possible any trimming after the tree is six years old; and always avoid cutting limbs out of the crotches, and when pruning carry some grafting wax with you to cover cuts on limbs of half an inch or over to exclude the air. And now permit me to say, visit your trees often, form the acquaintance of each one, and whenever you find one failing for any known or unknown cause, don't wait until it is entirely dead and broken down before

you make provision to fill the vacancy, but at once obtain another of the same or a better variety, (for all this time you will have been learning the value of trees for this climate) and set it in line about two to four feet from the other, north or south, and care for it as I have directed. This will change the course of your trees a little, but you can keep the rows straight one way; and as your desire and aim is apples and plenty of them, it will make no difference in their bearing, other things being all right.

Next, I consider the time for pruning very important for a Minnesota orchard, and I sum it up in my experience in a few words: Cut the limb at a time when the chances are that it will not be exposed to freezing before it begins to heal, and when it can have all the time possible to heal before winter. April 15th to June 1st is my time. Avoid all fall pruning in this climate, and if you should cut scions in the fall, do not cut nearer than an inch of the main stock, and trim closely the next spring. Avoid using a saw all you can, as a limb cut with a sharp knife heals over quicker. Cut all small limbs that when grown would be likely to crop in and make the center of the tree compact.

Now I wish to say a word about budding and grafting, without which this essay would be deficient, as it is important for several reasons. First, if you practice this it will awaken a greater interest in the orchard as to growth and progress. It will increase your observation, you will be constantly looking for something hardier and of better keeping quality, and when you find it bud or graft it into your most hardy stocks. Avoid cutting all the original top at once but take two or three years to form the new one.

I like budding best for the reason if it fails to grow it does not injure the limbs like cutting. Having learned and practiced the foregoing, you have created a new interest in the orchard. You will be anxious to see the result of your work. You will visit it oftener and care for it better; watching with new interest the union that is forming, and hail with delight the appearance of blossoms and fruit on the embryo twigs. I have read from the pen of practical fruit men that if a tree was not hardy enough to stand on its own stock it would be of no use to top-work it, but my experience is different; I have trees that bear heavy crops of good fruit that I know fail on their own stocks in body and crotches, hence I am top-working considerably, as I find we can utilize seedlings and worthless crabs to quite an extent by so doing. I find the Wealthy makes a good union on many kinds; even bears fine fruit on the Soulard crab. I have an excellent opinion so far of the Whit-

ney No. 20 for a stock to work on, but may change my mind.

The *modus operandi* of budding and grafting you can learn from any practical orchardist, so I will not detain you to describe it here.

Next I see in the directions given by your Secretary for this essay is protection from severities of the seasons, but I have been dealing on that more or less all along, and if you will follow the advice already given in this essay up to this time you will have an orchard that will stand the severities of any season like the past. What is yet to come we know not, and no class of persons look to the coming winter and spring, or in fact the whole season each year with more anxiety than the men engaged in fruit culture in this climate, as no tree that requires a shed built over it, or a mound of earth and straw built around it, or planted in a box on wheels and run into the cellar or laid down and covered in winter, can be grown with profit in Minnesota, and, as I, before stated, if you have followed my advice so far, you have an orchard with all the resisting and enduring power for a cold winter that is possible to give it in a profitable point of view; so I'll use no more of your valuable time on this point.

Next in order comes protection against insects, with which I have had perhaps less experience than on anything in the orchard. My plan is to destroy by burning all caterpillars as soon as discovered. Care for and protect all ant-hills I find in or near the orchard, as they are industrious fellows and destroy millions of lice. Destroy all fruit by feeding to hogs, or otherwise, that is injured by insects, causing it to fall prematurely. Place bands of building paper around the trunks of trees to keep insects from passing up. I have had no practical experience in sprinkling or showering trees with liquids to destroy canker worms, as they have not troubled me any. Still, when they are troublesome, a decoction made of whale-oil soap and rain water in proportion of one gallon to five is recommended by successful orchardists, and my observation of its effects convinces me that it is a good remedy. It is usually thrown into the tree by means of a syringe or force pump. There are many who would say that in this essay it would be useless to spend any time on harvesting and marketing the apple crop, as they would be willing to risk that if they only can raise them; but to me it is a matter of importance, and deserves a place in this paper. Early apples, and, in fact, all fall fruit, should be picked and handled carefully at least ten days before fully ripe, assorted and laid in a cool place until wanted for market, or for use. Winter apples, in this climate, can remain on the

trees till near the time cold weather begins, unless the fall should be late, then kept in a cool place other than the cellar until there is danger from freezing. The greatest of care should be used in picking. I find girls or women, where they can reach the fruit, handle it more carefully than men or boys. Step-ladders and saw-horses are best for picking from young trees, as by that means you avoid stepping and standing on the limbs, and more especially the crotches, which of all places in the tree should be preserved in this climate. Make step-ladders light and saw-horses three feet high, with top two by six, for standing on, and two steps on the side for low limbs, using a wire hook attached to a short pole to draw limbs so you can reach them. For older, higher trees, use a ladder made by splitting a pole to within two feet of the end, binding the end firmly, then spread the base three feet, putting in rounds to stand on. The single point will rest in the limbs while picking and not injure them. Use a basket holding half a bushel, hanging it by means of a hook to a belt, or on the round of the ladder. A sack over the shoulder can be used for hard winter fruit. Pick fruit only when it is dry, and when your fruit is placed in the cellar keep the temperature between thirty and forty, if possible, and if you can avoid keeping vegetables in the same cellar, do so.

My plan for a fruit cellar is double walls for the outside, double doors for the entrance. The under side of the joists ceiled so as to fill under floor with sawdust, or if you have no floor over it, put on two roofs, one two feet above the other, and fill the space between with straw; ventilate above and you can keep the temperature low by outside air passages made of tile or brick, opening from forty to eighty feet from the building. In this room you will find no difficulty in keeping fall apples for winter use, which is very convenient, especially for the holiday market, that comes before the best keeping winter apples are ripe. My fruit on exhibition has been kept in a place similar to this, but not fully perfected. The secret, I think, of keeping apples in a cool place, is this: if the temperature is kept low the ripening process goes on very slowly, hence the apples keep very much longer. Another advantage in a place of this kind is that you need not hurry to dispose of your late fall apples, but hold until the price suits you. For handling apples, a box holding about one bushel can be made as follows; the ends to be inch boards, ten inches wide and eleven inches long, and using laths two feet long for the top, bottom and sides, placing them one inch apart; this makes a very convenient

package for handling and marketing apples near home, and can be made so that the cost will not exceed fifteen cents per barrel; a box half that size is very convenient for handling crab apples, as most families do not wish to buy more than that amount at a time.

For preserving and keeping in cellar or fruit house in winter, I find shelves placed one above the other very handy, putting a board six inches wide around them, so you can lay apples on six to eight inches deep, and they can be easily assorted. In putting up fruit for market be particular to put in only good specimens; keep out the imperfect fruit for cider and home use; have the packages uniform throughout, and you will be much better satisfied with the results as well as those you deal with. Now in addition to the methods I have given you to prolong the season for marketing and utilizing your fruit, we still have the old way of drying about the stove or in the sun, and we have the improved methods by which one person can prepare twenty bushels or over in a day, and driers or evaporators which will prepare it for packing in a short time. As I said before, some think this talk about marketing is useless until a surplus is raised; but the same cry has been heard in other places, where, when they got trees adapted to their locality, they soon had fruit wasting on the ground. Already markets in this State have been glutted with home grown apples in the very neighborhoods where the old, old story, spoken of by Uncle Wilcox last winter, "You can't grow apples here," has oft been repeated. I consider orcharding, especially growing apples in Minnesota, only in its infancy, as since nurserymen have settled on the idea that our best future trees must be grown from native seedlings, they have been diligent in looking out and propagating the best they could find, and I think it not only possible, but very probable, that an apple will soon be found of better keeping qualities, and the tree as hardy or hardier, than our Wealthy. Another very important feature in the success of orchards in Minnesota is this: An effort must be made to create an interest in the minds of the rising generation, both boys and girls, in this business; give them trees of their own to set and cultivate, donate a piece of land for the purpose, learn them to bud and graft; it is a delightful and healthy occupation, good exercise and a chance to breathe God's pure air that cannot be found indoors in any business; this must be done to make orcharding a success, and soon as they become interested in the orchard they will manifest a desire to attend fairs and horticultural meetings, and ere long instead of seeing an audience made up largely of men past the meridian of

life, you will see the boys and girls before you anxious for information; then it will be that your orchards will prosper, and horticulturists will have no cause to wonder who will take their places in these meetings when they are called to rest. It would afford me much more pleasure to give a son of mine a dollar to become a member of some Horticultural Society than to attend a dance, or as friend Gideon would say, a horse race.

I find it almost impossible now to find a boy or young man that has any desire to learn how to care for apple trees. They have been educated to think that it is throwing away their time. This I hope will be changed. In this essay I have treated almost exclusively on an apple orchard, for the reason that peaches or pears cannot be raised in this climate profitably. Plums I have mentioned a few, and if you cannot procure the kinds I recommended then set the native or wild ones. There is more I would like to say, but this essay is already too long, and will close by saying do not falter or give up orcharding in Minnesota, but select the best localities you have, set the best trees you can buy, take care of them as I have directed, feed and nourish them, screen the trunk from heat of sun, ravages of animals and birds, visit them often, forming the acquaintance of each one, they will remind you of something in their history or their propagator. Prune when needed while young, and I believe a kind and beneficent Providence will reward your efforts with an abundance of fruit and you will always enjoy the satisfaction of knowing that your labors have been rewarded, and have the pleasant assurance that you have accomplished a great and lasting good for yourself and posterity.

ORCHARDING IN MINNESOTA.

BY GEO. J. KELLOGG, JANESVILLE, WIS.

The best site for an orchard is the highest ground at command; first choice, a northeastern slope; second, a northern slope bordering upon a lake or river, high enough to give a free circulation of air, thereby preventing frost, blight and mildew. Avoid high wind-breaks or bluffs on the east and north sides, and nothing on any side above fifteen or twenty feet, which may protect in a high

wind from blowing off the fruit. If winds prevail I would surround the orchard site at planting with a row of Norway spruce, eight feet apart and thirty-two feet outside the orchard, and setting every fifth row of trees in the orchard to *Arborvitæ* as a protection, both winter and summer, from high drying winds.

If you have not a favorable location, or if you must plant near the buildings, regardless of elevation, if the ground is level, put an underdrain in the center of each alternate space running one way. If it is impracticable to underdrain, plow the land the width of the rows, which I should make twenty feet apart, letting the dead furrow come directly under the place where the trees were to stand. After two or three plowings out, I would then reverse the operation and back-set, raising the place where the trees were to stand at least two feet higher than the dead furrow in the center between rows.

Soil is of more importance than elevation. The best soil is clay underlaid with limestone. Any clay soil is better than sandy soil ; timber soil far better than prairie. Avoid rich alluvial bottom lands. Steep hill sides, if rocky and not easily cultivated, often succeed admirably. If liable to wash, set deep or far enough back so the rains will not expose the roots. Avoid digging holes deeper than the whole field is plowed, and especially if those holes would retain the water. Any soil that will grow forty bushels shelled corn per acre is rich enough for orcharding. If you have any soil poorer than this, give an annual mulch of manure, but do not use any manure about or under the roots at time of planting. Immediately after the trees are planted, mulch liberally the surface for three feet each way. If the ground is rich use only half decomposed marsh hay or clean straw, shavings or sawdust ; if the ground needs it use manure.

CHOICE OF VARIETIES.

But first of all choice of stock upon which to grow varieties, I would root graft upon the most vigorous, hardy seedlings raised from hardy varieties, a sufficient number of Transcendent crab scions, using long scions and short roots. When these were two years old I would move them from the nursery to the orchard, setting them twenty feet apart each way. The following spring I would graft at the collar with Duchess of Oldenburg and Wealthy. In the fall I would protect these trees or grafts as high up as the limbs with a wisp of marsh hay, after having banked up around the body at least twelve inches with soil, to protect from mice and

bark bursting. I would make these grafts from uniform heads at two to three feet high, and when the branches were the size of a lead pencil to one-half inch in diameter, I would then graft a few to Alexander, Red Astrachan, Tetofski, Utters, Haas, Wolf River, Rollins' Pippins, Fameuse, Talman Sweet, Pewaukee and Willow Twig, with such other varieties as have gained any local reputation, adding a few varieties of crabs, the best of which I consider Whitney's No. 20 and Hyslop, for as long as Hyslop sells at \$5 per barrel in the Chicago market and Fall Wine Sap apple at \$1.50 per barrel, they will pay.

But I should depend on Duchess and Wealthy for 99-100ths of fruit and profit in dollars and cents.

In grafting do not cut off more than one-half the limbs of any tree in any one season. Any variety which is succeeding on soil and location like mine I should expect would do far better on Duchess or Wealthy stocks. But you are safe to grow these two varieties, and if you want to buy Spitzenberg, Baldwins or Greenings, Duchess money is the best money to use in buying them.

My advice would be to let Russian men grow Russian varieties till some good long keeper has proven itself free from blight and having a Duchess constitution. There are plenty of men who are trying these varieties. It is not profitable for the orchardist to grow many varieties or experiment with new kinds.

CARE AND CULTIVATION.

Low hoed crops only should be planted in the orchard annually, until the trees are large enough to bear, then seed to clover and pasture to hogs; never cut and remove any hay from the ground, if not fed down let it remain as a mulch. During the years of cultivation, avoid plowing nearer than six feet from the trees. Apply an annual mulch at the time of the first frosts in autumn; if the ground is rich, put on a poor mulch, if poor, a rich mulch as far out as the branches extend. A young tree should not make over eighteen inches of growth in a year, while a tree of bearing size should not make over six inches; if there is a probability of greater growth the leading shoots should be pinched off the 10th to 15th of June, and in no instance let any cultivation, hand weeding or hoeing be done about the trees after the 1st of July; if necessary use the scythe. The mulch should be removed and the soil cultivated lightly about the trees in May and June, until they get to bearing, after which cultivation should cease and the mulch remain.

Always at the time of applying the fall mulch mound up twelve inches about the tree with soil, (which mound should be removed in the spring) and see that the wisp of marsh hay protects the trunk summer and winter from the changing temperature of heat and cold.

Should there be a severe drouth in September and October, it may be necessary to apply a barrel of water to each tree to insure against dry root killing; this will hardly ever occur with the annual mulch.

PRUNING.

After the grafting is done, let all pruning be done with the thumb and finger; rub off all buds not wanted at time of starting. If you have pruning now that must be done, do it after the first flow of sap in the spring, when the sap begins to thicken, usually about the last of May or first of June. There is more danger pruning too much than too little.

INSECTS.

The Leaf Roller may be picked any time in winter, or a light sprinkle of Paris Green water upon the foliage while he is feeding in May will fix him. If any worm appears doing much damage, the same application will do.

Whenever the Canker Worm appears in great force, one pound of arsenic to one hundred gallons of water, the arsenic dissolved in in boiling water, and the solution stirred continually while it is being applied, is a sure remedy. The application may be made on small trees with a force pump and pail for bearing trees from a wagon, spraying the trees on the first appearance of the worm.

The hog pasturing will effectually cure the Codling Moth if sufficient hogs are kept to take all the early "worm falls."

The wisp of hay should gradually fall off as the trees come into bearing.

If the Apple Gouger appears you will have to hand pick the affected specimens and feed to stock.

By the application of poison as strong as the foliage will bear at the falling of the apple blossom, it is believed that the Codling Moth and Apple Gouger can be effectually destroyed.

If the foregoing advice is followed, you may look for fruit in paying quantities in six to eight years from the grafting.

have been transplanted and stood two years. They should not be dug before the twentieth of October, with the exception of a few varieties, and as much later as the nature of the season will admit. They must not be wrenched and torn from the ground by main strength. Let sharp spades do the work. If the trees are received in the fall, they should be buried root and branch. This is done by selecting a piece of dry ground, not subject to overflow, and at a place where the trees will not be molested by the pocket gophers. Open a ditch sufficiently long to receive the trees two feet deep, with one side and both ends perpendicular, and the other side sloping from the bottom of the ditch as wide as the trees are long, so that the tops of the trees will be even with the top surface of the ground. Untie the bundle or bundles of trees and place them in the ditch side by side, with the tops of the trees even with the top of the ground. Cover them up with clean, moist earth, two feet deep over the roots and two or three inches over the tops. Let them remain in this condition until the fifteenth or twentieth of May, or until the ground is sufficiently warm to plant corn. In all cases, before the trees are buried, the roots should be shortened in to five or six inches, and they will granulate at the points they were cut during the time they are buried, and will commence growth much earlier in the spring. Trees delivered in the spring from a distance, and received in a dried up condition, should be root and top pruned and buried a few days in moist earth, even if it is late in the season before they are planted out.

SOILS AND LOCATIONS, PREPARING THE GROUND, ETC., ETC.

Reject all low, frosty lands subject to late and early frosts, such as is to be found about small lakes and low valleys, marshy and damp, sour, sticky soil with no chance for drainage, as not good for fruit trees. In every instance after throwing out the above soils and locations, plant your fruit trees on the highest tillable land avoiding as much as possible a southern slope. To prepare ground for fruit trees as it should be done, does not mean to plough and crop for a few years and plant to fruit trees in the usual way. If the soil is dry, subsoil porous so that all surface water will soak through in a few hours, it will do to plough as deep as you can with two horses, follow with a subsoiler with two horses attached, one ahead of the other in the furrow, and loosen up the subsoil as deep as possible. Trenching is much better where a few trees are to be planted, but if the ground is naturally wet, sour and sticky, as is often the case in large portions of the country on all elevations, on

such land it is useless to plant trees. All such land must be thoroughly ditched, ploughed and subsoiled, and by so doing remove the unnatural moisture. When that is done it will be good for fruit trees, often the best. Fruit trees can never grow with their roots hermetically sealed in earth or water, the ground must be loose and airy. Ditching all land for fruit trees would be a great advantage and root killing would be much less frequent. If a thing is worth doing it will pay to do it well. A good fruit tree properly planted and cared for will often be of more value than 50 trees set out and managed in the usual way. The hole to secure the roots of fruit trees should be dug at least six feet in diameter and three feet deep, eight feet in diameter is still better. The earth should be returned just as it came out. A good plan is to dig the holes two feet deep and with a long bladed spade loosen up the subsoil a foot deep and fill the holes up with the top soil.

The distance apart to plant depends somewhat on the varieties. The Tetofsky may be planted ten feet apart and will not interfere with each other for years after they come into bearing, if they ever do. The Dutchess fourteen, and the Wealthy sixteen feet. But as a general rule for planting out orchards on the prairie, or much exposed ground, a rod apart each way will give the best results. In timber or protected localities, twenty-five or thirty feet each way.

This important fact should never be lost sight of on the prairie or much exposed ground. Plant your trees sufficiently thick to protect each other against winds and heavy storms. If this is done there will be little or no need of wind-breaks on any location. But if wind-breaks are considered necessary, we suggest the European Larch as the best tree that can be grown for that purpose; it is a rapid grower, perfectly hardy on all dry ground, ornamental, and free from all worms and insects, is valuable for posts, timber and fuel. The roots never sap the ground, is the first to put forth its leaves in the spring and the last to shed them in the fall, which find a permanent lodging place at the roots of the trees, and keep the soil in the best possible condition. The wood is strong and withy, and no wind or snow can break them down.

There are various opinions in regard to deep and shallow planting. From my own experience, and that of others, I am fully satisfied to get a good, healthy growth, the trees well established in the ground, shallow planting is altogether the best; but little or no deeper than they stood in the nursery, or the place from which they were dug. It makes no difference whether the trees are big or

little, plant shallow, unless the soil is sandy or very loose, and then but little deeper. Water should never be used in setting out fruit or any other trees; it is far better to pack the loose earth about the roots, and mulch lightly at once with leaves, marsh hay from old stack bottoms, or litter from the stable; wet the mulching and the ground will absorb the dampness, which is the only way that water should be applied to trees of any kind.

WHAT VARIETIES TO PLANT.

Never set out a large variety of fruit trees; that is the work of amateurs and nurserymen. Select a few varieties of well known tested sorts, consisting of summer, fall and winter varieties. For general planting on the prairie and exposed ground, I should suggest the following varieties: Tetofski, Early Strawberry and Duchess, for summer. For fall, Duchess, Wealthy, Whitney No. 20, and Powers' Large Red Crab. For winter, largely Wealthy, with some Minnesota, Rollins Pippin and Giant Swaar, and in favorable localities St. Lawrence, Fameuse, Plumb's Cider and Talman's Sweet.

We will now presume a young orchard has been set out just as it should be; every essential precaution has been taken; the varieties are all hardy, none of them subject to blight, all sound and thrifty; and to have perfect success in the future the trees must be so managed that they will continue in their present condition. This cannot be done unless the ground is kept loose and moist, and free from weeds and grass; the growth of the trees must be constant and as even as possible from the putting forth of the buds in the spring till vegetation ceases in the fall. Not one day from drouth or any other cause should be lost. It takes all of the growing season to ripen the wood and fruit of most of our standard varieties, and the closer we adhere to these important facts the greater will be our success. Indeed we know of no other way to test the hardiness of any variety than to ascertain the number of growing days it takes to ripen its wood, buds and sap cells. To keep fruit trees in perfect condition we have soil, climate, manure, mulching, water and brains; they are ample, and if we fail it is from ignorance, neglect, or because we are overworked.

We know of no better way of procedure with a young orchard that has just been set out than to mulch slightly with leaves, the bottoms of old haystacks of wild hay or litter from stables. If the ground is dry the mulching should be thoroughly wet. The mulching should cover the roots, and a little beyond—about two inches

thick when settled. Keep the soil moderately rich, so that it would at all times produce a good crop of corn, by the application of manure spread between the rows of trees.

Cultivate the ground three or four years after the trees have been set out, to corn, potatoes, beans, or any sowed crop, and keep the ground loose and clean by cultivation. At the expiration of three or four years sow to buckwheat each year early, which will keep down weeds and grass and the ground loose and moist. When the buckwheat begins to blossom, mow around the trees and mulch with it two or three inches deep, but not close to the crown of the trees. Leave a space of about two inches. This mulching will be sufficient until the following year, when the same should be repeated, and so on each year, and as the roots extend further out the mulching must be increased from year to year until the whole of the ground should be covered with mulching, provided the trees are a rod apart. Cropping of all kind should then cease, and the mulching continued each year by covering the surface of the ground one or two inches deep with straw or marsh hay, or litter from stable. The most critical time in the life of a fruit tree is when it is fruiting heavy. At this period it consumes double the amount of food and moisture; the condition of the soil about the roots must be carefully looked after, and if there is a lack of either they must be supplied, especially water. In some instances, where the trees are small, it is better to remove the fruit, as the growth of the trees will be worth more than the fruit.

Pruning fruit trees in some portions of our country where the atmosphere is naturally damp, probably works no injury to the trees; but in a country like this, where the atmosphere is dry and penetrating, it is injurious to cut anything from a fruit tree over a year old. Black heart is often the result of trimming. It sometimes becomes necessary to remove broken limbs and branches from trees. This should be done when the trees are making wood the fastest and the sap is the thickest, which is about the middle of June. The tenacity of life in trees about this date is so great that the bark stripped from the trunks, in a few hours will be coated over with a new bark. In all cases it is better where anything over a year old is removed from a tree to coat the wound over with grafting wax or gum shellac dissolved in alcohol. August is a bad month to molest the roots, or any part of fruit trees. There are times in this month when cuts or bruises are very injurious, and often fatal to trees, which at other times would have little or no bad effect. It is asserted on the very best of authority

that briars, willows, and all undergrowth, and even the Canada thistle, by cutting or mowing down at the proper time in August, will never sprout again. I know this by experience to be true in part. Budding is done in the spring and latter part of August and first part of September, usually by nurserymen and amateurs, on small seedling trees in nursery where the grafts failed to grow, and the seedling roots sent up shoots or sprouts.

Trees of any size can be budded, but grafting is considered the best. Budding is done by making a perpendicular slit on the stem of small trees and on the limbs of larger trees, with the point of a sharp knife, about an inch long, and a horizontal cut at the top through the bark about a third of an inch long, when complete resembles the letter T, or a cross. With the point of a knife loosen the bark from the wood at the top and slip in a well matured bud of the present year's growth, with the wood all taken out except the germ at the base of the bud, bind the outside bark around that of the bud with basswood bark or woolen yarn. The whole operation must be done rapidly on account of the air affecting the inside coating of the wood and bark when exposed. If the operation is done in the spring, all wood above the bud must be removed as soon as the bud shows indications of growth. If done in the fall let the upper wood remain on till spring and then remove.

Grafting is done in the spring by sawing off the limbs near the stem of the tree, and inserting one or two scions in the stubs by splitting, and then covering the wound with grafting wax. The whole operation is so well known that it is useless for me to describe it minutely.

If an entire change is to be made in a tree, it should be done gradually, say in three years, one-third each year. There is one important item that escaped my mind at the proper place in this paper. It is this: We often see it recommended through horticultural and other papers, scraping off the rough bark from fruit trees, and washing with weak lye or some other fluid. The former we know is wrong and we think the latter. The rough outside bark is as much protection to the trunks of trees against extremes of heat and cold in protecting the sap cells and inside bark, as the falling of the leaves in the forest and mulching the roots of the trees.

To be successful orchardists we must copy nature as close as possible in every particular. In northern latitudes, such as this, trees are all on the dwarf order, and more especially on the prairie,

which teaches us that fruit trees should be headed low, which form they would naturally assume if they were left to themselves.

Owing to the many good works that have been written on worms and insects that destroy fruit trees and fruit, and the best modes and remedies to destroy them, it is useless for me to enter on this subject in detail. We will only briefly notice the apple tree borer, caterpillar and apple-worm, which are the principal enemies to fruit trees and fruit.

The apple tree borer remains in the wood all winter and in the following spring is transformed to a pupa and comes forth a winged butterfly or beetle, flies about at night, and is seldom seen in the daytime. June and July the females deposit their eggs, one in a place on the bark of the trees, at or a little above the surface of the ground, and sometimes higher up, about the forks of the trees; from each of these eggs hatches a little small grub or maggot; this grub at first eats its way directly downward in the bark. By close examination of the trees at these places the last of August and the first of September, if the trees are infested with borers they can be easily detected by a little dark spot where they enter the bark, and can be easily found and destroyed. If they are not found till sometime afterwards they can be traced by the color of the bark or the use of an awl to their exact location where they are usually in the sap-wood under the bark. The best protection against borers is to keep the ground clean of weeds and grass, and the sprouts removed from about the roots of the trees; and the different species of woodpeckers, if left alone, will take care of the borer to perfection. It is usually neglected trees that are destroyed with the borers.

The eggs of the caterpillar are deposited on the twigs of the trees the first part of July and remain till the latter part of April and first of May, when they hatch out and make a nest in the nearest fork with their web which is small at first but soon increases in size, and if let alone the worms will soon strip the leaves from the tree. Trees should be closely watched during the time these worms are making their nests and destroyed at once with the hands, or the use of a shot gun and powder, which is the best when the trees are large.

The codling moth or apple worm is greatly on the increase, all from neglect. In some sections nearly every apple contains a worm. Without giving the habits of this worm, we will give the

best plan to get rid of them ; and if it was gone into universally the apple worm could be greatly diminished. It is this ; pick up and destroy all windfalls as soon as they fall, and what is much better, keep hogs in the orchard and let them eat them as soon as they fall. Some recommend bandaging the trunks of the trees with old sacks, and remove them once in two weeks and kill the worms. Hogs in an orchard is much the best way to destroy them. Picking and marketing early apples, such as the Tetofski, Duchess and such varieties, it is the desire of all fruit growers to get the highest market price for their fruit. To do this their fruit must be got to market in the best condition, which requires skill and judgment. The trees should not be stripped of all their fruit at the first picking, but gone over about three times at different times. At the first picking take the ripest, largest and highest colored fruit. Place it in bushel baskets in courses, with the stem ends up and the baskets rounding a little when full, the fruit averaging the same all through. Make them as attractive as possible, not to deceive. Carry them to market on a spring wagon. Cover with blankets, or something of that nature when on the road, to keep the sun and dust from them. Conduct the second picking the same way.

The last picking will be culls, but show them up to the best advantage, and get what they are worth. Although they cost nothing, as more was realized from the two first pickings than the whole of the apples would have brought if they had all been picked and sold together.

If those same varieties are to be sent to market by railroad some distance away, it is better to pack in barrels in the same order with a little clean chaff in the bottom of each barrel and over each course of apples as they are placed in the barrels. This will keep them from bruising while going through the rough handling that goods of all kinds get from railroad employees.

Winter apples, especially such as the Wealthy, should be carefully picked when ripe and perfectly dry, packed in barrels, bushel baskets are better. In either case a little clean, dry, wheat chaff should be placed in the bottom and between each layer of apples, and placed in a dry, airy, cool place until it begins to freeze, and then they should be removed to a dry, cool cellar. In this way the Wealthy apple can be kept till May in good condition.

ORCHARDING IN MINNESOTA.

By S. M. EMERY.

In considering this prolific subject, we presuppose the society's action in requesting essays upon orcharding is for the good of the masses, those whose tastes and inclinations, as well as the constant demand for standard fruits, urge them on to the possession and enjoyment of thrifty orchards in full and perfect bearing, but lacking the practical knowledge requisite to successful fruit growing.

The classes who are planting can be divided into two, professional and amateur. The former are usually men of wide experience, who have devoted the whole or a greater part of their lives to the pursuit of the business, and having tried all things, are naturally supposed to hold fast to methods indicative of success. The latter have much to learn, and, unfortunately, very little reliable data from which to base calculations, we, as a State, being singularly deficient in correct information of this nature.

A reliable farmers' journal, edited by men thoroughly conversant with the agriculture and horticulture of Minnesota, with an eye single to the needs of our farming community, is a crying want. We do not mean this as derogatory to the well-conducted columns devoted to the subject in some of our dailies and weeklies, which are useful so far as they go, but not equal to the emergency. This very lack throws our orchard-planting community upon their own slender resources, or else upon the tender mercies of irresponsible agents, whose business is to sell nursery stock, not to grow fruit.

Trusting for pardon for this digression, we will present a few practical suggestions so plain and simple that a way-faring man, though a fool, may not err therein. The first important point to consider is location. Upon this much depends. The bluffs along the streams, broken, irregular tracts of land, groves of natural timber, all abundant in the eastern half of the State, offer choice locations. In fact, they are natural orchard sites, and from their protected situations render it possible to set with perfect safety many varieties that would be worthless on level, wind-swept prairies. Use good common sense in the selection of the land upon which you intend to plant. The bluffs facing

the north are, as a rule, covered with young timber, while those directly opposite will be almost destitute of vegetation. Trees transplanted from a nursery cannot be expected to possess superior constitutions to oaks indigenous to the soil.

In the one instance the lay of the land is directly from the hot rays of the sun, which proves the colder the location, the more favorable to the development of timber, and consequently the more desirable for orcharding purposes. In explanation of this seeming paradox, we would state what is familiar to every practical fruit grower, that injury to fruit trees from the effects of climate, is invariably found upon examination to be the direct result of the hot rays of the sun in the latter part of the winter, stimulating a flow of sap during the day, which freezing at night ruptures the sap cells and bark, thus impairing the structures of the tree, destroying its functions and leaving it an easy prey to decay.

The most tender varieties will be found to do well if planted in close vicinity to and on the north side of a high board fence, running east and west, while the hardiest varieties would prove absolute failures planted ten feet away, and on the south side. Is not this proof conclusive?

From the above, the inference should be drawn that hill sides facing the north are naturally adapted to the ends in view. There is not a farm in the Northwest, that some particular spot does not offer special advantages in the matter of location. A very slight slope to the north may furnish the mean between moderate success and total failure.

Having used our best judgment in the selection of location, preparation of soil is the next in order. This can best be done by repeated deep plowing and successive harrowing until the sod is completely decomposed, and the land in fine garden condition.

Apple trees should be set sixteen feet apart each way, in rows running north and south. It adds to the general effect in neatness to place the trees directly in line. This can be readily done by means of stakes set sixteen feet apart in the outside rows. By sighting through each way the exact location of each tree can be determined.

Cherries and pears require the most advantageous locations, not being nearly so hardy as apples. They should be set the same distance apart. Plums admit of closer planting. If it is desired to obtain the advantages of the group system in setting a plum orchard, proceed as follows: For each thirteen trees mark a plat forty (40) feet square, set a stake at each corner and one in the exact

center; draw a line from each corner to the one opposite, crossing at the center stake; mark locations for the trees as follows: one in each corner and one half way between the corner trees on the outside lines, one in the center, and one on each of the lines meeting at the center twelve feet from the center. This places each tree twelve (12) feet from its neighbor and will ensure a distribution of pollen from tree to tree, no matter from which quarter the prevailing winds may come.

SELECTION OF VARIETIES.

In a bill of one hundred trees, (a very good start to an orchard,) the following apportionment would be advised, as the object to be attained is fruit for family use, and desirable market sorts for the surplus.

Of the hybrid varieties it is well to plant three each of the following: Early Strawberry, Whitney No. 20, Conical and Orange; these come into bearing very early, fruit abundantly, and the quality of fruit second to none; its only fault being a little undersized. The trees are hardy and form elegant stocks for top grafting, in case it become desirable to change at a later day to more promising varieties, should such develop; of Tetofski, ten (10,) Duchess, ten (10,) Wealthy, fifty (50,) and Minnesota, eighteen (18.)

This selection is based upon the following: Commencing with the first named, the fruit ripens in regular succession from July 25th. The hybrids are for family use and will supply the demand ordinarily with the number as recommended. The Tetofski is, as a rule, a late bearer; as an early harvest apple, their beauty and good looks give them higher rank than is deserved. The Duchess follow in season and should be depended upon as filling the bill for green cooking apples; by judicious thinning good samples can be obtained for market, and the quality of those remaining be considerably improved; they at times are subject to sun-scald and to be beaten from the trees by midsummer storms; ripening as they do in the midst of the hurry of harvest, and being a poor keeper, it is better to plant heavily of a more desirable variety, than which none excels the Wealthy: fitly named indeed. It is the bright and particular star in the galaxy of Minnesota favorites. Kind nature put forth her best efforts when she presented the Northwest with this elegant fruit, considering it from every possible stand point. First, as to its nursery habits: It is a rapid, symmetrical grower, with a splendid equipment of roots; from the main roots of the tree a multitude of smaller roots are thrown out in all directions,

varying from the size of a lead pencil to a broom straw; these in turn being furnished with fibrous rootlets in great abundance, giving the secret of its rapid, regular habit of growth. Being a very early bearer it is deservedly taking a high rank throughout the Northern states. Though not a first-class keeper, if picked and handled carefully and properly stored, it remains sound until past midwinter. For top grafting it is unequalled as a stock.

The Minnesota is one of the hybrids, and recommended for hardiness, abundance and size of fruit, and is our best keeper. The fruit will average larger than the English Russet, is subacid, quality good; in color yellowish white, or streaked with faint pink on one cheek. In shape pyriform, and is a regular bearer.

The ground being in a thorough state of preparation and the trees selected, plant as follows: First dig holes thirty inches across and eighteen inches deep, pulverize the earth at the bottom, and if the soil is inclined to be wet or cold, place a thin flat stone twelve inches square, six inches below the bottom of the hole; heap up earth in bottom of hole in a conical shape, six inches high; trim off the ends of all broken roots and dip the roots of the tree in a puddle of earth and water mixed to the consistency of thick paint. Place the tree upon the center of the mound, straighten out the roots with care, then by hand work fine soil into all the root interstices, being careful to fill all spaces; this being done, cover with sufficient earth so that the pressure of the foot will not bruise the roots, and tramp firmly on all sides. Repeat this process of filling and tramping until the earth removed from the hole is replaced and the tree so firmly set as not to be shaken in the ground by the action of the wind. Leave the surface earth loose and sloping from the outer edge of the circle down to the body of the tree. As soon as planted mulch with rotten straw or with broad flat stones.

DO NOT WATER IN PLANTING.

When set, prune immediately by removing all limbs that interfere with general symmetry, any that rub each other by action of the wind, and cut back half of the previous year's growth of wood exactly to a bud. Any limbs cut at this time will not require applications of paint or wax to prevent bleeding. At intervals of a month remove all water sprouts or suckers which may start before the middle of August. These same rules for pruning can be safely followed year after year, except cutting back the previous year's

growth of wood, doing the work from May 1st up to and not later than July 15th.

These rules for pruning are based upon the supposition that the nurseryman has furnished trees that have been properly grown and trimmed as nursery trees. If this be the case, the tree will be well branched and in future trimming the general outline of the nurseryman can be followed, preventing as far as possible the formation of crotches. Avoid extremes of very dense or too open a top. A moderately close top stands the rigor of winter better, as to a certain extent it furnishes its own protection. The best cultivation that can be given is to plant corn year after year between the rows, as long as any can be produced. Mark out rows each way four feet apart; do all cultivating not later than July 15th. Keep the orchard free from grass or weeds; pick corn when ripe; leave stalks standing to collect and hold the snow on the orchard, and to shelter from the direct sun's rays. As soon as ground is frozen three inches deep mulch again heavily, being careful not to place the material in direct contact with the body of the tree.

For perfect winter protection twist coarse hay into ropes an inch in diameter and wind the trunks of the trees from the ground to the crotches. Remove these the following spring to avoid affording a harbor for vermin and insects. A very simple winter protection can be made as follows: Measure the tree from the crotch to the ground, cut two pieces of fencing this length and nail together trough shaped; lean against the trunk of the tree on south side; these can be gathered up in spring and laid away for future winter use. In case thoroughly healthy trees of hardy varieties of apples and plums are planted and cared for in the manner above described they will, beyond the shadow of a doubt, be a profitable investment to the planter. Ample protection from the ravages of animals must be provided, and injuries from teams must also be avoided.

The harvesting and handling of the fruit is a delightful task, and is the golden fruition of the patient planter.

Do not wait until the fruit is nearly grown before you begin to thin the fruit. A peck of large, smooth, highly colored specimens will sell for more than double the quantity of small, inferior ones. The market is always open for fair-sized, green cooking apples.

Provide adjustable ladders, and gather all fruit by hand. It is tedious, but the extra condition of the fruit will well repay the extra labor. Avoid rehandling. For city trade, the bushel splint basket, with flat cover is the best; the size is convenient, and can

be economically packed and shipped. For the present the services of a reliable commission man can not be dispensed with.

As the trade assumes greater proportion, suitable drying and canning establishments will be provided, and the difficulties from the perishable nature of the commodity be overcome. Plums deserve more careful treatment even than apples, and should be packed in quart boxes and crates, being careful to pick before perfectly ripe. Their quality is so rich, and their beauty so great, that they have already taken a high place in the markets.

With our limited acquaintance with the tree, we feel perfectly safe in advising you to border your orchard on the south and west exposures, with the Russian mulberry set as a hedge, four feet apart. Considered only as a forest tree and as a shelter belt to the orchard, it is as fully entitled to the position of guardian to valuable property, as any tree in the land. With the constant inquiry for new pursuits and means of labor, the culture of silk worms and silk in the Northwest can but prove profitable and fascinating, and those of us of eastern or southern parentage remember well the delicious character of the fruit of the mulberry. The culture of this tree is beyond that of an experiment, and is in our own state an assured success.

Top grafting is performed as follows, and in three different ways, termed cleft, saddle and whip grafting. Its object being to change the quality and kind of fruit that was borne by the parent stock. No wood is used in this work of more than one season's growth. The scions should be cut in November, prior to hard freezing weather. The most favorable season for grafting is after buds begin to swell and before they open. Cleft and whip grafting are commonly used for top or outdoor work. Cleft grafting is the usual method when the stock is larger than the scion, and is done as follows: Saw off limb to be grafted, split open with the chisel through the center, open up the split with a narrow wedge, cut scions three buds in length, and sloping on each side, so as to conform to the shape of the opening in the limb when forced open by the wedge; place two scions, so the bark on both scion and limb will be in juxtaposition, and then remove the wedge, the natural spring of the wood will hold the scions firmly; then cover all exposed portions of scions and stock with a wax formed of one part beeswax, one part tallow, and five parts rosin, this to be kept in working order by being immersed in hot water. If the stock to be worked is larger than two inches, four scions can be used, although a better plan is to topwork trees of this size in the

limbs. Avoid a juncture of fast and slow growing varieties; they do not form a good union. Whip grafting is done in the same manner as root grafting. A sloping cut being made on the stock and scion to correspond with each other, and a cut is then made in the face of this cut in such a manner that when placed with the faces of the cut to each other and forced, with a sufficient pressure together, the cut sections of wood will cause the scion and stock to adhere firmly together. They should then be wound with cloth and the whole waxed so as to exclude the air and moisture. Saddle grafting is used but little, and is not practical for outdoor work.

Budding is of more importance in the propagation of cherry and peach stock, although it is used in apple culture by eastern nurserymen. Stocks one and two years old is the customary age. The work is done as follows, and in August and September: A longitudinal slit is made barely through the bark one and one-half inches in length, and from three to six inches above the ground; this slit is now cut at right angles by a cut in the opposite direction half an inch in length. By means of a thin ivory, metal or wooden wedge, rounded in shape, the bark is carefully loosened from the wood around the cuts as described, and is then ready for the reception of the bud. The bud is taken from a scion of the previous year's wood, and is cut from the scion with so much of the surrounding bark attached as can be readily placed under the bark on the stock in the receptacle as above described; carefully remove all wood from the interior of the bark to which the bud is attached, being particular not to injure the chit or germ of the bud. Insert the bud under the bark and adjust the cut edges smoothly over the piece inserted, adjusting the bud so that it will be located at the right angle of the cuts in the bark of the stock; wind securely with strips of thin muslin, or what is better the inner bark of basswood; allow this bandage to remain ten days or two weeks, by which time union will have taken place and the cuts healed up. The bud will lie dormant until the following spring, when it will start the same as others. After the bud shows unmistakable signs of life in the spring, the old wood above the new bud can be cut back and it then is in the condition of a grafted tree.

The pests injurious to orchards in Minnesota are not as plentiful as in the older horticultural states. Among the most common may be named borers, aphids or leaf louse, codling moth, curculio, mice and rabbits.

Lack of time prevents an extended treatment of the various subjects. The simplest remedies and treatment will be given: The Borer, in the shape of a beetle, harbors during the winter months in the rough bark of the tree; common sense will indicate a course that by scraping off dead and decayed bark and washing with such preparations as will keep the bark smooth and clean.

Their eggs are deposited in rows around the bark of the tree; these hatch and the product is in the shape of a small worm, which bores its way into the soft, new growth of bark, and subsists here until again developing into a beetle. Close examination will develop their presence by fresh holes or borings, which will be thrown out. They can be destroyed by tapping the bark on and about the hole in the early stages of their work, and at a later date by inserting a sharp wire into the hole and killing the worm. In cases of extreme necessity it is better to cut them out bodily, covering the wound with wax or paint. The locust seems to be natural breeding grounds for the Borer, and should not be planted contiguous to the orchard.

The sap-sucker is the natural enemy of the borer, and as such ought to be protected to the fullest extent. Don't believe the silly idea that he is doing injury to your trees. He is one of the best friends the fruit tree has, and as such ought not to have the hospitalities of a short gun presented to him. Loose bands of cloth tied about the trunk of the tree in such a manner that the beetle can crawl in under, but not upward, is also a very efficient trap. Remove the cloths and destroy the beetle by hot water, or otherwise.

The aphid is the product of an egg of a very small fly. The larvæ make their appearance in June and July, and may be readily detected by the curled and shriveled leaves. Treatment is best given by means of a mild decoction of tobacco, in which the ends of the boughs may be dipped. The amount of harm done is often overestimated, they, as a rule, only retarding a luxuriant growth.

The codling moth is doing more damage to orchards and fruit growers than all other pests together. It has spoiled the prospects of many a bushel of fine fruit, and should receive vigorous opposition. The injury done is the work of a moth which deposits its larvæ when the fruit is in blossom. Each blossom thus stung is either killed, or, if the fruit comes to maturity, it is damaged by the occupant, a small white worm. The remedy is to carefully gather all wind falls and feed to pigs, as the worm escaping from the fruit on the ground enters the soil and undergoes transforma-

tion into a parent beetle, to go forth again on its destructive mission. At that season of the year when the blossoms are about to open, wide-mouth jars partially filled with sweetened water and suspended in the branches will be the means of destroying many of the moths. As they do their traveling principally by night, torches, lanterns or lamps, without chimneys, placed about in the orchard on still nights will destroy many, but the one thing most important for the destruction of the codling moth is the entire destruction by fire or animals of the wind falls and stung fruit.

Curculio so destructive in the eastern and southern States do but little harm to our plums, as the skin of the fruit of our hardy trees is so tough that hard stinging is required to place the egg in the pit of the plum. The best method for destroying this pest is to spread sheets under the trees, and by jarring the trunk and limbs the beetle falls on the sheet, curls up and lies quiet a sufficient length of time to be caught and destroyed. It is advisable to gather up windfalls of the plum and destroy in the same manner as with apples.

Destruction of trees by mice and rabbits can be easily prevented. They seldom work on nursery stock, except in the dead of winter when their natural food is covered by snow. Grass should not be allowed to grow around the tree as it offers snug hiding places for mice. The workings and runways of these vermin can easily be seen on the fresh snow, and arsenic placed on the cut surface of sweet apples or carrots easily compasses their death; the apples should be placed on sharpened sticks, stuck in the snow in their runways, being careful that domestic animals will not have access to the poison.

The foregoing presupposes great labor conscientiously performed and if so performed, will prove orcharding in Minnesota an absolute success.

Want of time precludes the possibility of touching ever so lightly upon the æsthetic side of orcharding.

It has been said that "the man who cultivates flowers about his home, will never see his children inmates of the penitentiary." If this be true, and we know that the closer one lives to nature, and the better her ways and workings are understood, the truer and better life one leads. How elevating must be the influence of a perfect orchard, each tree a fragrant bouquet of pink and white blossoms, whose perfume, like the elixir of life, makes the old man young again, carried by clinging associations, adown the long vista of years to the old orchard of his childhood.

If it was the veritable "pyrus malus" that tempted our honored maternal ancestor to her downfall, and her descendants to their present inheritance of sin and misery, who can say but that by universal cultivation, we may again be returned to a state of pristine purity by the well known law of "similia similibus curantur." And if we do not recognize that like cures like, we will as a unit admit that a well conducted orchard is emblematic of home happiness and prosperity.

ORCHARDING FOR MINNESOTA.

Gentlemen and Members of the State Horticultural Society:

You have done a wise thing in advertising for a prize essay upon the above subject, and I trust that it will bring out many facts that will prove of vital importance to our people. I do not enter the list of competitors because I have any expectation of carrying off the prize, but because I love the subject. I think I know something about it, and am willing to contribute my mite to the horticultural literature of the State. Nature has her laws and some of them are applicable to every industry and avocation pursued man, and it is our privilege to investigate those laws, and profit by such as have a bearing upon our several callings. Not every man can make a success in the same business, and so one of the most important factors in the planting and management of an orchard is the man at its head. He should be a man of ordinary intelligence; should understand the nature of soils, and the habits of trees, be careful, diligent and observing, and carry into the business an energy that will enable him to combat difficulties and overcome obstacles as they as they arise, and if he has not a knowledge acquired by experience, be capable of acquiring such knowledge by study and observation. He should be possessed of faith and hope in a large degree, and when he has advanced so far towards success that his trees are bearing their first fruits, and insects, birds and wicked boys step in and attempt to despoil them, charity will help him to endure all things.

SELECTION OF SITE.

Almost any location can be made to answer for an orchard, except the rich creek and river bottoms, and the sloughs and sags in the prairies. The best site however is the high and dry summits of the white oak ridges, where the soil is deep, but only moderately rich. The advantages of such a situation are freedom from frosts in spring and fall, and a soil not so rich as to stimulate an overgrowth of the tree; the tree therefore completes its annual growth earlier, and ripens up its wood and is rendered more hardy to withstand the severe cold of winter. On ridges, also there is not that extreme variation of atmospheric temperature that occurs in bottom lands and valleys. In the day-time the temperature in a valley or hollow protected by high bluffs and trees will be several degrees warmer than on the top of bluffs or elevations, and in the night the case is reversed, and the temperature in the valley will fall five to ten degrees lower than on the bluffs. The highest swells upon the rolling prairie also make good sites for an orchard, but the greater fertility of the soil renders it necessary to cease cultivation earlier in the summer, lest the trees be stimulated to make too late an autumn growth. Another very good location is well up on the side hills of well defined valleys.

An essential point toward success is in the selection of the soil for an orchard. A good, loamy clay with an open, porous subsoil, or a sandy loam have been demonstrated to be the very best. A soil where sand predominates soon parts with such properties as are essential in the structure and formation of vigorous and healthy trees, and the perfecting of the highest flavor and quality of fruit, and is liable to be injuriously affected by the heat and drouth of summer, and from its dry and loose nature the roots are more liable to receive injury in a severe, snowless winter. Neither is a stiff clay desirable, as it will retain too much moisture in a wet time, and when dry is hard and impervious to the action of the atmosphere. The deep vegetable humus and alluvial deposits of which much of the soil in the river bottoms and the depressions in the prairies is composed is also unfavorable, as it is too easily stimulated to make a rank growth of immature wood that cannot withstand the asperities of a Minnesota winter. If the location and soil are favorable the aspect is of less importance, but where a choice can be had I should select ground that declined a little to the north, northeast or east. A south-western aspect is the least desirable of any, for the reason that our most destructive winds come from that direction and the

sun's rays impart their greatest heat at about 2 P. M., and in summer the trees become stunted on that side from sap-scald, and in winter the reflection from the ground when covered with snow causes the sap to rise prematurely, and the succeeding cold night ruptures the sap cells upon that side, enfeebling the tree and causing premature decay and death.

• PREPARATION OF SOIL.

The man who expects to grow and harvest a good and paying crop of corn, would prepare his ground for the crop in the best and most careful manner. Still more important is it that the ground for an orchard, where the trees are expected to endure and produce fruit for a lifetime, should receive a thorough preparation before the trees are set upon it. All soils where clay predominates, are greatly benefited by under-draining. It is a question of expense, and is not much practiced in this State, but would make some of our wet and tenacious soils the most profitable for orchard planting. Where under-draining cannot be done, we will do best to pass by such places and select soil of a more loamy friable nature, (any land where, if a hole were dug three feet deep and filled with water, it would settle away and disappear in three or four hours, will not require under-drainage). In most localities the preparation is best done with a heavy team and plow. It is well to plow the ground very deep the fall before the trees are to be set, leaving it as rough as may be for the winter, and go over it in the spring with a harrow to level and fine the surface. It would be still better to plow the ground once in August and again just before winter sets in, harrowing once or twice between. If the ground is too compact it may be stirred in the spring with a cultivator. If the orchard is to be located on untamed and unbroken soil, it should first be broken up and the sod given time to rot, and then one or more hoed crops, as corn or potatoes, taken from it. The deeper the plowing the better, and as good surface drainage is imperative, if the land is nearly flat, as is the case with much of our prairie, it is well to back-furrow on a line where the trees are to stand so that they may be planted on a ridge which will give considerable surface drainage and leave open furrows between the rows to conduct away the surplus water and in which at some future time, if found necessary, tiles may be laid. The natural inclination of the surface should be observed before plowing, so that the dead-furrows may have sufficient fall to carry off all water that may run into them, and yet not have so much that the running water would wash out

deep gulleys. If the soil is too poor to bring a fair crop of corn or potatoes, it should receive a good dressing of barnyard manure and have a hoed crop taken off; or better yet, summer fallowing the season before planting the trees. The orchard ground should be securely enclosed with a hedge or fence to keep out cattle and other stock, and that it may securely hold young pigs for purposes that will be noticed hereafter. A five-board fence serves in addition as a partial protection and wind-break, but two boards at bottom and three barbed wires above suit my views the best. This fencing is best done before the trees are planted. If a hedge is used it is best of evergreen trees, and not too close to outside rows of fruit trees.

WHERE TO PROCURE TREES.

Before we get too far along it is well to look around among the nurserymen and see where we can secure the best trees, (unless happily we have grown our own). The worst policy a man can pursue is to order them from some traveling vender of whom he knows nothing, and it is not always safe to trust an honest agent's judgment, for he would naturally be a little warped in favor of his employer. If you know a nurseryman who grows his own seedling stocks, and uses for the purpose Wisconsin or Minnesota grown seeds, selected from the hardiest and best varieties; who gives his trees clean and careful culture, and plenty of room to grow in; is careful in pruning to form well balanced heads and no crotches that will split down and ruin the trees in after years; who keeps every variety correctly labeled, and who digs and handles the trees so that they retain a fair proportion of their roots, and consigns to the brush heap all unsound and worthless stock, by all means encourage him with your patronage. Trees without sufficient roots, with scarred and deformed trunks and lopsided and forked tops would be dear as a free gift.

While I am an advocate of spring planting I shall insist that the trees are much the best dug and top and root pruned, if necessary, in the fall. They should then be heeled-in or buried with the roots entirely out of the reach of frost. Trees should not be dug too early in the fall, not before the season's growth is completed and the wood is ripened up, and the leaves have fallen or have performed all their functions. This is liable to be done where large fall deliveries are made. Digging trees in spring is a practice that ought to be condemned, and some of our best nurserymen are obviating the necessity of it by erecting large cellars for storing their

trees for the spring sales. The sap starts as soon in spring as the frost is out of the ground, and the bending and swaying of the tree in the process of digging frequently loosens the bark from the wood, and it afterwards dries and makes what is called sun-scaled. Also, spring-dug trees do not have time to heal over the roots that are cut in digging before the buds push, and they start more feebly, do not get as well matured in the fall and consequently receive injuries the next winter that cause them to become black-hearted. In heeling-in trees that are to remain over winter dig a trench with a sloping bank that is raised by throwing the earth on that side. Open the bundles and place the trees in it with their tops leaning to the south, (the trench should run east and west with sloping bank on south side,) and carefully fill fine earth in amongst and over the roots so as to leave no openings for mice or air to get in, and be sure to round up so that no water shall run into the trench. Choose for the purpose a dry, sheltered knoll or bank. Heeled-in in this manner the tops will shade themselves, and the roots and the soil about them is not exposed to the direct rays of the sun, which would cause frequent thawing and freezing.

PLANTING.

This will require the exercise of some skill and patient labor to do it well. For this climate, spring is the best season, and the right time is after the frost is all out of the ground and it has become dry and warm enough so that vegetation will soon start, but before the buds have started on the trees. If the ground has been well and deeply plowed, it is not necessary to open holes larger than to receive the roots without cramping. If not so prepared the holes should be dug at least six feet across, and as deep as the ground will hereafter be stirred, and good surface soil filled in the bottom up to where the roots of the tree are to set. After the hole is dug the tree is to be placed just where it is wanted, an inch lower than it grew in the nursery, and held there by one hand or by an assistant, and after the fibers and roots are spread out naturally, proceed to work fine surface soil, previously provided, among them. A slight shake of the tree will assist in settling it among them. After the roots are all covered, with no cavities left to admit air, give a gentle pressure with the foot, particularly about the ends of the roots and towards the trunk, to render the tree firm in its place, and then with a spade finish filling up with fine earth, which, if dry, should be pressed reasonably firm with the foot, except an inch on the surface, which is to

remain as loose and mellow as possible. When finished, the tree should stand perpendicular, or leaning slightly to the southwest, and it should be mulched for six feet around with some material that will keep the temperature of the ground even and prevent rapid evaporation of moisture. It expedites business considerably to lay off the whole ground and set a stake where each tree is to stand before any are planted. Absolutely straight rows give the best satisfaction. For laying off the ground stretch a line upon one side of the plat for the first row, having measured it and marked with a knot or string where each stake is to be set. Set the stakes and move the line to the place for the next row, and so continue until the whole is laid off. This is for the square form. The quincunx order of planting offers a plan by which a greater number of trees may be planted upon a given area, so that each shall have the greatest possible room. This is not the simple affair that some would suppose, and I will attempt a description. First determine the point for the center of each tree in one of the outer rows. This is easiest done by stretching the line that has been measured and marked, as before mentioned, or better yet, have the marks at one-half the distance between the trees, and set the stakes at every other mark. We will suppose that these are twenty feet apart. Now, to determine where the next row is to stand, or the distance between the rows, take a line forty feet in length, with a knot in the middle, and place its two ends at two contiguous stakes, then straighten the knot or mark until the whole line becomes stretched in two equal lengths, and the knot or mark will indicate the exact point where the tree in the next row is to stand. Now measure from this point to the center on a line between the two trees of the first row that were made the base of operation, and you have ascertained the distance between the rows. Stretch the line at that distance from the first, and set stakes at the alternate marks from the first, then move line and stake same as first row, and so alternating until the whole is completed. By this method each tree occupies the center of a hexagon of equal sides, and is, consequently, equidistant from every other tree, and the advantages are that they can be planted closer together and more nearly occupy the whole space, without crowding each other at certain points.

DISTANCE APART TO PLANT.

Upon this point our best fruit growers disagree, but the majority favor close planting—some even as close as 12 to 16 feet. This

in my opinion is all wrong. In close planting the roots will soon run together and interlock each other and rob the soil of nutriment and moisture, and the tops will interlace and prevent free circulation of air, and instead of broad, symmetrically-headed trees the tops will stretch upward for room and sunshine and air, and blight and other diseases will prevail to a greater extent. But say they, we will thin the trees before they crowd. That means to throw away three-fourths of the trees before they have brought any returns, and it will seldom be done. Taking them out later is only to destroy the whole, and good fruit trees are too expensive to be treated in that manner. Even if they were not more susceptible to blight and would produce as much fine fruit, which they will not, 25 feet on the open prairies and 30 in sheltered locations is the nearest distance that I would recommend. Where trees are planted at a distance apart, I would recommend an evergreen to be set, if in the square form in the center of each square, if in the quincunx form in the center of each equilateral triangle, for the purpose of protection and for amelioration of the atmosphere. These will not rob the soil or dry it out for any great distance, and they will bear any amount of clipping and cutting back, and can thus be kept under control. Small evergreens cost but little, and will add very much to the beauty of the place, and when the fruit trees fill and shade the whole ground, they can be removed. In planting trees, after I have set a stake where the tree is to stand I take a board five feet long and six inches wide, with an inch auger hole in each end and a notch in the center, and one small stake for each end that will readily slip through the holes; lay the board down with the notch fitting to the stake. Then insert the end stakes, remove the board and center stake and dig the hole. Then lay the board back over the end stakes. Set the tree to have the trunk fit into the notch where the first stake stood. This saves the time and trouble of sighting back on the rows to keep them straight.

PRUNING.

I am an advocate of low heads, not that I would have all the branches come out at or near the surface of the ground like a currant bush, but I would train to a clean, smooth trunk 3 to 5 feet high, according to the variety and locality, the lowest being for open prairies and exposed situations, not allowing all of the branches to come out at one point, but training up a leader in the center and leaving branches along as they are required. While some

pruning will always be necessary it is difficult to lay down any arbitrary rules for it. The unnecessary limbs should be removed every year after the first. No branch should be allowed to grow in such a shape as to form a crotch to split down in after years. In the center, limbs that cross each other and chafe should be removed. Care should be taken to keep the tops of the trees sufficiently open to admit sunshine and air for perfecting the fruit, but it is not well to remove too many of the top branches at one time lest the sun strike the trunk too hard. In pruning, the branches removed should be cut close to the juncture with the trunk or other branch, and the wound made smooth with a sharp knife. Long stumps will not heal over quickly, and usually die back to the base and carry disease to the heart of the tree. The light pruning is best done between the middle of June and the first of August. If this is commenced when the trees are young and continued annually, there will be no large branches to remove, but if in any event a large limb must be removed, it is best to do it between November and March, and the wound made by it should immediately be covered with white paint or grafting cement.

The land in a young orchard must be kept under cultivation. It is as essential to keep down grass and weeds as for any farm crop. Any hoed crop that does not require culture after the middle of July may be grown for ten years, or until the trees come into full bearing. I prefer corn or potatoes. If the soil is poor it may be improved with barnyard manure spread over the surface in the fall. After the trees are in full bearing no crop but the fruit should be taken from the ground. Still the ground ought to be kept loose and free from weeds, which may be done with plow and cultivator, or by young pigs being kept in the lot during the early summer months; or it may be seeded to clover and mowed twice in the season, and the hay is to be left upon the ground as a mulch and to help keep up fertility. All crops raised in the orchard should be such as do not rapidly impoverish the soil.

AGE FOR TRANSPLANTING.

It is generally conceded that two or three-year-old trees are the best for starting an orchard. My choice is three years. Larger trees are more difficult to dig and preserve the roots, are much more expensive to transplant, and do not recover from the shock of transplanting as soon from the nursery, while smaller trees are more liable to get run over and broken in cultivating.

VARIETIES.

We have now come to a very critical point in our paper. Minnesota is a large State and presents a diversity of soils and climate. For the southeastern parts I would recommend Duchess of Oldenburg, Wealthy, St. Lawrence, Tallman Sweet, Walbridge, Fameuse, Utter or Cooper, Plumb's Cider and Willow Twig. These will be pretty sure to live and bear fruit in paying quantities as far north as Lake Pepin and not more than two counties west. North and west of this drop the Plumb's Cider and Willow Twig and add Tetofski. If there are other varieties that are known to succeed in any neighborhood they may be planted in that vicinity. Where the common apple will succeed plant Whitney's No. 20, Powers' large red Virginia and Maiden's Blush crabs in limited quantities. Conical, Beeches' Sweet, Orange, Minnesota and Quaker Beauty are also good varieties. For the more unfavored localities and the north and west, I can only say plant Duchess, Tetofski and Wealthy for fruit, and the Walbridge and Tallman Sweet and other varieties for trial. Drop the Minnesota from the crabs and add Pride of Minneapolis and Early Stawberry, and if you care to risk the blight, the Transcendent. There may be something better, but I have not seen them.

BUDDING AND GRAFTING.

These arts are easily mastered but much better taught by object lessons than I can do it on paper. The operation of budding is usually performed upon trees or branches from one to three years old, and can only be done in the growing season. It consists in separating a bud with a portion of the bark attached from a shoot of the current season's growth, and inserting it beneath the bark of another tree or branch and binding it in place with a string until it has grown fast and become a part of the tree. This bud is expected to remain dormant until the next spring, when the tree or branch is to be cut away to within two or three inches of the bud, and after it has started to grow all that part of the stock above is to be cut away and the bud grows on and eventually becomes the top or branch of the tree. The best season for budding in this climate is between the middle of July and 20th of August. The buds should be well developed in the axil of the leaf of the shoot intended to bud from, and the bark must rise freely from the stock to be budded on; and this only happens when

the stocks are in a thrifty condition. The only instrument necessary in the operation is a common two bladed pocket knife. The large blade is for removing any branches that are in the way of inserting the bud. The smaller for preparing the bud, making the incision and lifting the bark on the stock. To prepare the bud, remove the leaves from the stock to be budded from, leaving about half of the stem to handle the bud by; take the shoot in one hand and the knife in the other; the edge of the knife is placed on the shoot half an inch above the bud to be removed; the thumb of the knife hand rests on the shoot below the bud, a drawing cut is then made parallel with the shoot, removing the bud and the bark to which it is attached half an inch above and three quarters below it. The cut is just deep enough so that a small portion of the wood is taken off with it, which may be allowed to remain, or be taken out if it parts freely. Now a smooth place on the stock is chosen where two incisions are made to the depth of the bark, one across the top of the other so as to form a T; the bark on the two edges of the perpendicular cut is raised with the point of the knife and the bud is inserted between them and kept in its place by winding a string tightly around; best matting, woolen yarn or cotton thread will answer for tying. The tying may be removed in about ten days.

Grafting is the insertion of a scion of one species or variety on the stem or branch of another. The best scions are shoots of the previous year's growth. Stocks may be of any age from a yearling, seedling to a tree of many years, but of whatever age, should be sound and healthy. The best methods and most easily practised are whip grafting and cleft grafting. In whip grafting the stock ought to be not more two years old. The grafter removes the top, making a smooth even cut about one inch long from the bottom upwards, and in the center of this cut he makes a slit or tongue downwards. The scion, which should contain two or three buds, is cut on the lower end with a sloping cut downwards and similar, in all respects, to that made on the stock; a slit or tongue is made in it upwards, corresponding with that on the stock, and they are neatly fitted together, the tongue of each within the other, and the inner bark of both brought in perfect contact, at least on one side; it is then to be wrapped with a narrow strip of waxed cloth or paper, covering the parts united. Cleft grafting is practised on trees or branches too large for whip grafting. In this case the scion is cut precisely in the form of a wedge. The part for insertion should be about one inch or one inch and a half long, with a bud at the shoulder where it is to rest on the stock; the outer edge of

the wedge should also be somewhat thicker than the inner. The stock is sawed off at the point for grafting, and if an inch or less in diameter a sloping cut is made on one side of the stock about one inch and a half long, and coming about to the center. The stock is split by laying a chisel or knife on the horizontal surface and striking it lightly with a hammer or mallet, and the split is kept open with the knife or chisel until the scion is inserted with the bud and thickest side out, and then well waxed over. Grafts of this kind make a better union than where two scions are used. On stocks of large size use two scions, cutting one away in a year or two. The inner bark of the scion and stock must meet in this method same as in whip grafting. Some grafters spread the tops outward and cross the inner bark to be more sure of connection.

PROTECTION.

After the orchard is planted some protection will be beneficial. To protect the trunk from the fierce rays of the sun upon the southwest side, set a stake or narrow strip of board a few inches from the tree, to remain until the top has grown sufficient to shade the trunk from the direct rays of the sun, or if it can be afforded, plant an evergreen about three feet from the tree on that side, and never let it get higher than the lower branches of the fruit tree, always cutting the stray branches back, which will not hurt them but cause them to thicken up their foliage. Evergreens do not sap the ground of moisture like deciduous trees and will shield the surface and the tree from the hot rays of the sun. All young trees should have a mound of soil thrown up about them in the fall, say ten or twelve inches high, and removed in spring. This affords protection to the roots from frost, carries the water away from rains and melting snow, prevents the tree swaying in the wind and loosing the bark at the surface of the ground. It also serves as a protection against mice, that are one of the worst pests we have to contend with. They delight to work under the loose snow and feed upon the bark of the tree, but seldom work above it. "Winter mulching" with old straw, hay or leaves, is always a good winter protection for the roots. Rabbits are another pest to the orchard, frequently destroying whole orchards by gnawing the bark, which is a favorite food of theirs. A boy, dog and gun are a good protection. Smearing the trees with blood or rubbing the trunk with raw liver will usually save them. Wrapping thick paper about the trunk or winding with hay rope is effectual. For

the open prairies shelter-belts and wind-breaks of rapid growing trees will be required. They should be quite dense on the west side, but only thick enough to break the force of the wind on the north and south, leaving the east side open. In no case should the shelter-belt be less than sixty feet of the outside row and upon the north side six rods. Closer confines the air too much and tends to encourage blight.

PROTECTION FROM INSECTS.

The insects most damaging to the orchard are aphides, tent caterpillars, canker worm, flat headed borer, codling moth and apple curculio. The aphis or plant louse feeds upon the young shoots and leaves of fruit trees, usually on the under sides, and near the ends of the shoots

REMEDIES.

Dipping the ends of the shoots affected, in a solution of whale oil soap, or strong tobacco tea or a solution of carbolic soap. When the trees are too large to dip, the application may be made with a garden syringe. Two doses will generally conquer them.

TENT CATERPILLAR.

These insects form tent like webs in the forks of the trees and devour the foliage.

REMEDIES.

First is to destroy the eggs which are to be found in winter clustered around the young branches, forming a ring or bracelet, covered with a gluey substance to protect them from moisture. Next is tearing down the nests by twisting a brush or forked stick in it and crushing the worms. Kerosene, strong soap suds, and whitewash are all said to be efficient remedies.

The canker worm is very injurious when anyways numerous. The female is a ringless insect and lays her eggs in October and March, or rather there are two species of them laying their eggs at these times; one depositing the eggs on branches in well exposed situations, glued together side by side, the other depositing them under scales of bark, in birds' nests or in clumps of dried leaves.

REMEDIES.

Syringing the tree with a mixture of Paris Green or London Purple and water. Jarring the trees and gathering the caterpillars which will drop and hang suspended by a silken thread; searching for and destroying the eggs before they hatch, or trapping the females by pasting bands smeared with tar or other sticky substance about the trunk of the trees. The apple tree borer is the larva of a beetle and is very destructive to the trees. The female lays her eggs upon the bark in June or July; after hatching, the young eats its way through the bark and makes roads or burrows upward next the sap wood, just the size of its body, enlarging them as it increases in size, pushing the sawdust like chips out at the hole where it entered, and finally eats a large cavity into the heartwood to form a place for its last transformation.

REMEDIES.

Rub the bark around the trunk and lower branches with soft soap about the first of June. Search out the burrows and cut out the grub with a sharp knife or probe them with an awl or wire and plug the hole with hard soap.

OYSTER SHELL BARK LOUSE.

This insect can be destroyed or kept from the trees by giving them a wash with lye or strong soap suds every year in June. Kerosene applied with a paint brush is said to be effectual.

APPLE WORM OR CODLING MOTH.

This insect is so destructive to our fruit that it deserves more than a passing notice, which the length of this paper and time will not permit. It is demonstrated that there are two broods of them in a season. For the first the moth deposits the eggs one at a time, in the calyx end of the apple, soon after it is out of blossom. The life of the insect, from the egg to the perfect moth, is from six to eight weeks, when the moths immediately pair and deposit their eggs for another generation in the now half-grown plant. These latter leave the fruit in six or eight weeks and crawl away into secure hiding places to pass the winter in the larva state, and in spring transform into perfect moths. They are often found in winter concealed under the hoops of and in the creases of apple barrels and bins.

REMEDIES.

- 1st. Destroying them in their winter quarters.
- 2d. Pasturing the orchard with young pigs and picking off and destroying all wormy fruit.
- 3d. Entrapping the worms under bands or other contrivances. The well known habit of the worm to seek shelter under scales of bark and whatever else will afford shelter on the trees where they have been reared when about to transform, renders the latter an easy and very efficient remedy. The bands may be of an old cloth, carpet, or paper, or even hay. I have found paper the best and most convenient to use. Take manilla paper or second hand flour sacks ; cut wide enough to fold twice, and when done four inches wide, and long enough to reach around the trunk of the tree ; slope a little when put around the tree so that the upper edge shall fit close and the lower a little loose, and fasten with a carpet tack. They should be put on by the last of June and examined every nine days and all worms found between the folds and under them crushed by running the bands through a wringer or by some other method.

Some species of birds are very beneficial to the farmer in helping to keep insects in check, and should receive protection. The following are beneficial to the orchardist: Bluebird, tit mouse, warblers, wren, nuthatches, creepers, martins, swallows, tanagers, finches, song sparrows, chipping sparrows, field sparrows, buntings, indigo bird, grosbeak, ground robin, blackbirds, king bird, pewee, cuckoo, or rain crow, night hawk and whippoorwill, woodpecker, except the yellow-billed (*Sphy. rapicus varius*), and quail. The robin, cat bird and brown thrush are among the doubtful. The birds that ought to be destroyed are cedar bird, Baltimore oriole, and the yellow-billed wood pecker, or sap-sucker.

GATHERING, KEEPING AND MARKETING OF FRUIT.

This is a branch of the subject that requires the most careful attention, for after we have taken pains in producing fine fruit it is a great loss if we do not take equal pains in gathering and storing it for home use or the market, and yet very few fruit growers seem to appreciate that this is an important part of their business. Summer apples, and especially those inclined to mealiness, should be picked early, or as soon as they are ripe. Ripeness is indicated by the seeds turning dark color and the stem parting readily from

the tree when lifted upward. Winter apples should be allowed to remain upon the trees as long as vegetation is active, or until there is danger of frosts. The only proper mode of gathering is by hand picking, in which a folding or step ladder is a great convenience. The branch to be gathered should be taken in one hand and the fruit carefully picked off one at a time, with their stems attached with the other. They should then be carefully laid in shallow baskets, the bottoms covered with paper to prevent bruises, and fruit should only be gathered in dry weather after the dew is off. Summer varieties, after picking, should be carried into a cool, dry room, and placed in thin layers upon shelves or tables, or, if for market, should be carefully placed in market baskets, or boxes, one by one in layers, so assorted that they are uniform in size and appearance, without any small, specked or knotty specimens in the middle or bottom of the package, but uniform throughout, and sent to market in spring wagons, or by steamboat or railroad. If boxes are used, they are better to have a bale to handle them by, and should not hold more than one bushel each, and if the varieties are choice, it will pay to wrap each specimen in soft papers, as oranges are packed. It is the practice in Eastern orchards, with winter apples designed for market, to pick by hand and carry into a dry, cool room, where they are laid in heaps three or four feet deep, or sometimes in the orchard to remain a couple of weeks, in which time they sweat and part with considerable moisture, and become quite dry when they are packed in clean, new barrels. They are placed in the barrels carefully arranged in layers, and the barrels tightly headed up, having been filled so that the head presses firmly upon the fruit to prevent shaking about when they are ready for the market. They should never be rolled or jolted in transportation, and it pays to assort and leave out all bruised, wormy or knotty specimens, and keep them for home consumption or the cider mill. For home consumption winter apples should be carefully assorted, keeping the best and the poorest, the sound and the bruised, and the earlier and later ripening varieties all separate. When all such are thrown together they will quickly decay. They may be put into clean barrels, each barrel marked, or they may be stored in bins in a room where an even, cool temperature can be maintained; in any case they should be kept at as low a temperature as possible without freezing. A cool, dry cellar is as good a place as any after winter has partly set in.

ORCHARDING IN MINNESOTA.

BY W. J. ABERNETHY, OF MINNEAPOLIS.

Mr. President and Members of the State Horticultural Society:

If I understand the object of this Society in offering a premium for essays on orcharding, it is that the general planting and cultivation of orchards throughout the State might be encouraged, and the simplest and best methods of securing a supply of fruit for the family ascertained. Accordingly in this essay, which will be brief, I shall try to point out the most approved plans now known among fruit growers for selecting varieties and a site, setting the trees and their future care.

At the outset I am confronted with the fact that a general article will not apply to all localities in our State, for on its eastern side, bordering the Mississippi, we have the bluff lands which shut in this great river, with their steep sides, their deep rich valleys and generally clayey soil. Further west we come to timber land, and beyond this the prairie, generally level, though often undulating, while farther to the north and west we strike the dead level of the Red River Valley stretching north and south for 200 miles. In these four different classes of soils, with their different phases of surface, the selection of a site would of course be different in each case.

But there are some general rules which will apply to all, and first let me name the general

PREPARATION OF THE SOIL.

Our modern apple tree is the direct product of civilization ; it is no longer the wild, snarled denizen of the forest, but a cultivated, refined scion of advanced life. In its veins, may be, flows the blood of a "Duchess." Its parents may have been "Maltby," and on the "Russet" brown cheeks of its progeny, the "Golden" hue of its "Fameuse" origin may appear. Reared not on the streets but in

a nursery, tenderly cared for in infancy, trained by skillful hands, fed with the most approved food, do you think it in accordance with the laws of nature that it should do well if transplanted from its home, where every condition necessary for its growth was at hand into a wild uncultivated prairie? No, indeed. It is of too tender blood. It must be set on land that has been subdued by cropping and made mellow with the plow, for this is the requirement of its cultivated nature.

THE SITE FOR AN ORCHARD.

It is nice to have your orchard adjoin your house. In our New England homes this was almost always the case, and to go out of the back door in leafy May or June and step in among the apple blossoms was not only eminently picturesque but very nice. But out here there is an objection which cannot be overcome without much trouble. We have days in winter that are so warm that the sap often starts in the middle of the day in places on the trunk, to again freeze at night, and the result is that on the south side of the trees appear in the spring a great black streak of dead bark. And not always the length of the tree, but in blotches here and there. Now if the orchard were on the north side of a slope, this would not have happened. What then? Why if your ground is rolling anywhere towards the north, choose this for your orchard, and put your vineyard on the southern slope. But what shall I do on a dead level? There is only one plan to be pursued in this case. Back furrow your land until you have it well raised in ridges about sixteen feet from center to center and on these set your trees. They must have drainage, for they are too tender to bear wet and cold feet and will be short lived if they are long kept in this condition. But supposing I live in the timber? Well, cut out the trees as much as possible around where your orchard is to be set, so that they can have the air. Set no groves around them to break the force of the winds, but let the pure air of heaven blow through them, for they breathe as much as we, and the purer the atmosphere the healthier their growth. I have in mind an orchard in Iowa, where the owner set a thick hedge about it of forest trees. It grew to be so tight that the wind hardly could get a chance through it. The result was that the last time I saw it, the orchard looked as if an attack of cholera had gone through it. Blight and disease had done their work, and I don't believe there is a tree left there to-day.

BUYING TREES.

"How am I going to get my trees and what varieties shall I select? I live a hundred miles from any good nursery and I am not acquainted with varieties," says one. I answer, if an agent comes along representing a good establishment, I should order of him and have my trees delivered in the fall. I am ashamed of this society, as progressive as it is in many things, that on this one point it has shown such a weakness as to warn and continually warn, at every meeting and without exception, people against what they choose to term "tree peddlers." How, I ask, can any wholesale dealer in any commodity dispose of his wares unless through traveling men? There is not a jobbing house in St. Paul or Minneapolis but that keeps from one to a dozen men out soliciting; and when a responsible firm sends out a man to represent them and take orders, I say buy of him, unless you can go to the nursery yourself. To say that the agent is dishonest, is to say that the firm he represents are swindlers. If they represent and do not fill orders true to name, then it is time to condemn, and post them. But I wouldn't buy out of the State. The nearer home you can get your stock the better.

FALL OR SPRING DELIVERY.

I want to advise you by all means to buy in the fall. When you get your trees bury them in as dry a place as you can find, root and branch. Don't let a single twig be exposed, for you will find usually that at the juncture where the earth at the surface comes around the bark, it will be injured by freezing and thawing. If you have your trees on hand in the fall they can be set early in the spring, which is a great advantage. You are always so busy, too, in the spring that you have not the time to go after them, and for this reason fall delivery is better.

VARIETIES TO PLANT.

I know of only one perfectly hardy valuable standard tree, and this is the Duchess of Oldenburg. It is a splendid fall apple and one of the best cooking varieties we have. The Wealthy comes next, and while not as hardy as the first named, still passes by the name of iron-clad. These two should be the main varieties. There are some new seedlings of promise that are hardy and which,

trust, will be recommended for not only trial but for general cultivation at this meeting. The fruit interests of the State are languishing for a hardy late keeper of even fair quality. I think if I were setting an orchard, I should put in a few Tetofski for summer use, and also some few of the St. Lawrence, Walbridge and Plumb's Cider for later varieties.

DISTANCE APART.

Some plant even only eight feet apart, some ten, some twelve, some sixteen, and some even thirty-two feet. I think from twelve to sixteen feet is better and the latter distance more preferable.

SETTING.

Before you set your trees see that each ragged root is carefully cut back to good white wood. The new rootlets start from the juncture between bark and wood, and if it is dead and ragged at the end their growth will be slow or not at all. I wouldn't trim back the top very much. It is enough of a shock to the tree to cut off its legs at the ankles without cutting off its arms at the elbows. I used to think differently, but experience has led me to change my mind and I think that the cutting off of the broken limbs should be all that needs be done at first.

In setting dig a big hole deeper than you need your tree to be set; throw in some of the surface soil first, making the middle of the hole the highest, set your tree on this elevation a little deeper than it was in the nursery, and then on it put more of the top soil; see that the dirt is packed carefully around the roots and leave the surface of the ground around the roots a little hollowing at first so that the early rains may thoroughly soak into the earth about it. Leave all mulching off and let the warm sun shine on both the tree and the earth about it, for there is no artifice for propagation equal to the warm sun of spring. Take plenty of time for setting, and be careful to have each row in line if you would have a symmetrical orchard.

AFTER CARE.

If you want an orchard, keep all the stock out of it; don't, I beg you, try to pasture your cows on the trees; don't even let them once walk through it, for a broken limb may destroy forever the beauty of your tree. If it has been well set it ought soon to begin

to unfold its buds, and as long as the season is wet and until the dry spell sets in, keep all mulching off and let the sun warm the soil ; but as soon as the drouth comes then

MULCH.

I am not so much of an enthusiast on this subject as my friend Pearce. I tried heavy mulching one year to my sorrow. I just piled it on late in the fall and kept it on in the spring. Other of my trees started, but the heavy mulched one remained as dormant as if it was January. The month of May went by and not even an opening bud. In despair I raked it away and found the earth frozen beneath. Now I rake it away early in the spring, spade up the soil all about them to let in the sun's rays, and later on put it back again as a protection against the dry weather. I use coarse manure for this, not only as a good mulch but also as a fertilizer. I think heavy mulching the year 'round is a mistake. The cultivated apple tree has a mass of fibrous rootlets near the surface and is not like the wild forest tree whose roots strike deep into the earth. It was accustomed to cultivation in the nursery and there its surface roots developed without any mulch. Let it drink in and feed on the warm sun in the spring, but protect it from its fierce rays in summer, and as winter approaches, give the earth a coating of manure about it as a covering against frost.

CULTIVATION.

I think an orchard ought to be cultivated. The best authorities say so, and my own experience confirms it. But do all your cultivation early so as not to promote a late growth.

KEEP THE BARK HEALTHY.

In the spring I go over my trees with a solution of strong soap suds—even weak lye will do no hurt. I take an old broom and pail and I thoroughly scrub the bodies and up into the limbs with it. It kills the insects that may have hidden there, makes the bark look fresh and healthy and promotes vigor of growth.

RABBITS AND MICE.

Many a young orchard has been killed by these pests gnawing the bark in winter. The cheapest and best thing I ever tried was

tarred paper. I cut it in strips and wind it around and tie with a string. It not only protects against them, but also against sun scald.

PRUNING.

One general rule will apply to pruning. Cut out your wood so that the sun can get into the middle of your trees. Prune from the inside—not the outside. Let the limbs grow low on the body. Encourage a central shoot and cut off every aspiring limb that tries to make a fork in your tree. I prune at any time in the year and cover the wound with a little grafting wax.

RESETTING.

If any of your trees die as they sometimes will with the best of care, reset them at once. Don't delay a single season if you would have a compact orchard.

BLIGHT.

On this subject I "am at sea." It has always been my terror. I know of no effective way to stop it, only with the knife. I always draw it out and cut below the diseased wood and burn the part cut off. If the tree is too badly diseased with it, dig it up and throw it out and reset. Some think sulphur is good, and some a combination of sulphur and lime, but neither is a full preventive.

INSECTS.

A herd of insects stand ready to injure both your tree and fruit. The borer is perhaps the most dangerous, for he kills. He works at the trunk close to the ground usually, and before one is aware of it has girdled your tree or bored into it so as to seriously cripple it. I keep ashes around the trunks of mine and watch them closely. Should you see fine borings of wood there it is the borer. Hunt for him with knife or wire until you find him. The leaf-roller and the coddling moth are destructive, the former to buds and the latter to fruit. Keep a close watch and destroy them and their nests. I know of no other preventive.

THE FRUIT.

And now, if you have followed these directions carefully given above, in three or four years you will begin to see the reward of your

labors in the shape of fruit. And oh! how luscious will the apples look, and how delicious will they taste if you have grown them! But won't you see them and taste them at their best? Then if they set too thickly, thin out a part of the fruit. Don't let them overbear when young, but remove a portion for the good of the rest.

BUDDING AND GRAFTING.

It would seem as if this part properly belonged to the work of the nurseryman rather than the farmer. Yet both are easy to learn and may be practiced by any one. Budding consists in transferring the bud of one tree to another. It must be done when the sap is at its full flow and after the leaf has fully formed, so that the bark will cleave from the wood readily. Cut in the bark an incision like a letter T. Take a bud from the shoot of this year, after it is fully developed, by shaving off the bark an inch and a half in length, with a small part of the wood left underneath the bud. Gently raise the bark open, have cut and slip in the bud, first cutting off the leaf to a short distance above its base. Tie with a piece of bass-wood bark or a narrow strip of cloth. When the limb expands so that the cloth binds, unloose and finally remove it. The next spring the bud will start and the limb above it should be cut off.

GRAFTING.

I presume every farmer's boy knows how to set a graft. If it be cleft grafting, he knows that the limb must be sawn squarely off, a split made in the middle, his graft shaved down to a point and carefully inserted in the split. The graft should have two buds on it and the whole cut surface should be covered with grafting-wax. Great care should be observed to see that the back of the stock and graft exactly join. There is whip and saddle grafting which is frequently practiced on large stocks, but the most common method is root grafting. This is the method performed by our nurserymen generally in winter, and consists in taking the roots of yearling seedling apple trees and inserting the grafts immediately in the part below the earth, and planting them out in the spring.

HARVESTING AND MARKETING.

One thing more and I am done. If we are fortunate enough to grow fruit in any quantities, it must be sold. It should always be

picked by hand, and if disposed of in the market, packed in clean barrels. The packing should be done so that no rattling will occur in the barrel. The fruit ought to be assorted and only the best sold. Apples will last longer if they are placed in piles for two or three weeks before packing. The barrel should be shaken several times in filling and heaped at the top when the head is put in. A pressure should be applied to force them down so that there be no shaking up and down of the fruits.

It has been my fortune to travel much over this State. I have been up and down and over it, again and again, and the barrenness of nearly all the so-called homes in it is heart-sickening. How much of health and beauty might be imparted were there growing on every farm not only a good orchard but a good supply of every other kind of fruit. My own place is not large, but I have it filled, every available part of it, with apple and crab trees, grapes, plums, strawberries, raspberries, blackberries and currants, and although all are of recent setting, yet our table has been supplied once a day most of the time since last spring, either from this or the vegetable garden. I wish I could, and I speak it from the heart, say something that would induce every householder in Minnesota to have these delicacies, which our kind Heavenly Father has given us, on his table the year round, for the good of himself and family, as well as for the pleasure and satisfaction their cultivation and development will bring him.

SECRETARY'S PORTFOLIO.

PROF. BUDD IN EUROPE.

A NEW SEARCH FOR IRON-CLAD FRUIT TREES IN RUSSIA.

INTRODUCTORY BY THE SECRETARY.

Careful readers in the literature of Western Horticulture are aware that in the study of the races of fruit trees, and their adaptation, by reason of race peculiarities, to successful transfers from one portion of the earth to another, Prof. J. L. Budd, Professor of Horticulture in the State Agricultural College at Ames, Iowa occupies an advanced position. They have noted his suggestions from time to time, in the Iowa reports, and in letters to the Horticultural Societies of Minnesota and other States, as to the distinctions to be made between the Siberian crabs and their crosses and the Astrachanica crabs and apples and their crosses—the hardiness of the former to stand our winters and their extreme tenderness to endure our hot, dry summers, from characteristics brought with them from their native country, so different in climate, on the whole, from ours, and the hardiness of the latter here in both winter and summer, due to their having fitted themselves by hundreds of years of use and custom to a climate combining extreme cold in winter and absence of snow protection, with excessive heat and long periods of occasional drouth in summer—similar to the conditions we have to contend with in fruit culture in Iowa and Min-

nesota. They have followed him in his tracings of the successful varieties of the eastern part of the United States, and the Agricultural Department Russians, so-called, to their origin in the damp coast regions of Europe, and in his explanations of their general failure in the Northwest, on account of that origin ; have heard his warning to drop the Siberian because of their blighting habits and the Coast Europeans for their inability to stand any of our test seasons ; and have heard his intimations of clues he has obtained to hardy and good varieties yet to be found in the interior of Russia. I confess for one that in reading Prof. Budd concerning these things, while in no wise moved to give up the idea of continued and more careful experiments in seedlings of sorts we have, which certainly contain more or less good blood and progressive adaptation to our soil and climate, wherever the original blood came from,—I have been greatly inclined to tie to him for a while, to encourage his researches, and to hope that he may bring to us, from the land of the Duchess of Oldenburg, and further east and north, an extended list of varieties of fruit trees that do not blight or winter kill, and that may comprise the keepers that we must have before the Northwest can be called a fruit country. I like to hail for news the men who search for fundamental facts to explain our difficulties and suggest reliefs, and this inclination has placed me in communication with Prof. Budd, and enabled me to offer now the following letters and notes from him, showing what he has done and what he has found during the past summer and autumn in following up the Russian clues referred to. I sincerely hope they may prove to be as important to our Society as they are interesting to me :

BEFORE THE JOURNEY.

IOWA AGRICULTURAL COLLEGE, AMES, June 12, 1882.

Oliver Gibbs, Jr.:

MY DEAR SIR :—I am sorry I cannot be with you at your summer meeting to compare notes on experimental horticulture for the cold north.

I start this week for a trip into Northern Europe and Asia to look up the iron-clad fruit question. Chas. Gibb, of Abbotsford, Canada, goes with me. The purpose is to study the apples, pears, cherries, plums, apricots, etc., from the standpoint of size, appearance and quality, and in connection with the air and soil where they grow. I shall bring home much stock with me.

Yours with respect,

J. L. BUDD.

THE PROFESSOR RETURNED.

AMES, November 27, 1882.

Your letter received. * * *

My trip to Europe was out of the beaten ruts. The portions of Europe north of the Carpathian mountains was carefully explored, as this immense section is all a prairie country and subject to the downpour of the polar winds and extremes of winter temperature. We found hundreds of miles east of Moscow, on the anciently populated steppes, races of the apple, pear, plum and cherry that will live and bear fruit in any part of Minnesota. This is not guess work, as without snow they are liable to extremes of 45 degrees and even 50 degrees Fahr. I may be able to give you some specific notes. We spent two months in central Russia, and I think our experience valuable to the prairie States. * * *

J. L. BUDD.

AMES, December 2, 1882.

Your kind letter at hand. I do hope and believe that my two months' labor in central Russia will prove useful to the great Northwest.

Having some surplus copies of some of my northern letters—written hastily under peculiar disadvantages—I send them to you. Purposely I did not put in many names, knowing they would be badly rendered by newspaper proof readers. Please look them over. You can get an idea of my honest impressions while among the orchards of the far interior of Russia, far north of Lake City. Kazan has a rougher climate than Minnesota, and even down the Volga, at Simbirsk, Saratov, Volsk, Orel, etc., the summers are as hot and dry and the winters are much colder. Often in the interior there is no snow until after the mercury goes 45 below zero.

If your time will permit you can pick out of these letters some notes that are more trusty and accurate than we yet have had. The coast apples and pears of Russia will not do for you. The far interior ones surely are what you want. Urge that your experimental stations let the crabs alone and give trial to a more promising line of fruits. This is my disinterested advice.

Yours,

J. L. BUDD.

*EXTRACTS AND NOTES FROM PROFESSOR
BUDD'S EUROPEAN LETTERS.*

The material for notes referred to in the foregoing letter of December 2, consists of copies of the "Western Farm Journal," and clippings from the "Iowa State Register," both published at Des Moines.

NOTES FROM FRANCE.

The first letter is from Barres, France, and gives an account of his visit to "the ancestral home of the De Vilmorins, known over the world during the past century as leaders in all lines of horticulture and economic botany." He visited the place by special appointment, and had "the real and unexpected pleasure of being guided over the rare old place by Maurice De Vilmorin in person." Here he first notes some remarkable

VARIATIONS IN THE SCOTCH PINE, (*Pinus Sylvestris*)

Ranging from very valuable to nearly worthless. Two of the extreme variations he describes—one is a Russian form, called *Riga Pine*. The original plantation of this form, grown from seed is now of a size suitable for sloop or small schooner masts, and as straight as arrows, and the Professor says: "I cannot describe the pleasure I experienced in wandering through these acres of towering pines growing nearer to each other than would be supposed possible where attaining such size and height. In other parts of the grounds are plantations of this upright form of the *Sylvestris* pine, *grown from the seed of those first planted*. Even the *third generation of them* have attained a height of 20 to 30 feet, and as straight as candles. The other is the French form found on the mountains of Central France. In all respects this form is unsuitable for a timber tree. The specimens are crooked, irregular in growth, and have no comparative value when grown either for ornament or timber. Yet Mr. Vilmorin assured us that this form of Scotch pine bears the greatest quantity of seed, and that the seed is far more certain to germinate. Hence it has been the *commercial*

seed found in the seed stores of the continent. There are thirty or more intermediate forms of the Scotch pine on the Vilmorin grounds. Here also Prof. Budd found many forms of

THE WHITE POPLAR.

Unknown or not yet introduced in the United States, and predicts that the best forms of this variety will yet become our leading lumber trees for hundreds of economic uses in building. Some of them are as erect in form as the Lombardy, and very little given to sprouting.

At Metz Prof. Budd spent a day looking over one of the oldest nurseries in France—that of Simon Louis.

FRUIT TREES AT METZ.

In the matter of fruits he found here over 1,000 varieties gathered from all parts of the temperate zones, but without any attempt to divide into species or races. "Indeed in England, France and the German States no thought has been given to the races or species of any of the fruits. They accept experience as a guide without any inquiry into origin or native country. But a change is coming in large portions of France and Germany. The recent destructive winters have wrought havoc over great extents of country, such as we have never known in the prairie States. At Metz and along the fruitful valley of the Moselle the people now use the word *resiste* as frequently as we use the term *Iron-Clad*. In the young nurseries at Metz we now find two-thirds of the varieties of the apple and pear to show in leaf and bud an admixture of northern forms of these fruits. The 'survival of the fittest' has guided these recent plantings, however without thought to any guiding principle as to race such as they apply to other trees and shrubs.

"As a rule, without exception, horticultural men take great interest in our work of taking comparative notes as we proceed northward. So far as we can learn our trip is novel in its design and purpose. The general expression is that it will indirectly benefit large portions of France and Germany, as well as the prairie States of America. The terrible winter of 1879 and 1880 was enough to set such men as Simon Louis to thinking on the subject of determinate growth as a measure of hardiness."

METHODS IN FRENCH NURSERIES.

"After saying that in extent and variety the Metz nursery exceeded all expectations, and that we hope to secure a great num-

ber of hardy trees and shrubs from their great stock, I must admit that an American nurseryman would starve if he attempted to adopt their modes of propagation and management. To us it seems that not one move had been made in advance, since the time when Lindley wrote the 'Theory and Practice of Horticulture.' So far as we could see, nothing is done in the way of root grafting the fruits. Everything is propagated by some one of the many forms of budding and grafting above the ground. The question of tender stocks connected with this mode of grafting wrought mischief in 1880 such as we never knew in Iowa. Again, all trees are grown to great height in nursery. Hence the bracts that strengthen the stem are rubbed off and every tree of apple, pear, cherry, plum and most forest trees are kept erect by tying to stakes. In the growing of stocks, and small shrubs and plants they have much success and great skill. In the growing of espaliers and other forms of training on wires and walls, they also have great success and skill. But labor is cheap and it is a question, if we can learn much in modes and methods except in a few special lines.

"The manner of growing forest trees for street and avenue planting is an evident gain. *No tree is accepted* unless it has a straight stem of at least eight feet without blemish or scar. Most of the street and avenue trees have stems ten feet in length when planted, with a neat symmetrical top. As a rule the large cities have these grown under regular contract which specifies size, height and species. Park making, avenue planting, and even planting for railroad stations and beer and wine gardens is here a *thing of system, rule and order.*

RAILWAY PARKS.

"At railway stations in France and Germany we do not alight amid shanties and dark suspicious looking saloons. *The scene is park-light* with good buildings and wide streets and promenades. At several stations I have walked into the gardens to find the man in charge, with a garden frock on, busily at work. If I saw a tree or shrub I did not know, in every case he was quick and accurate in giving me the Latin name, which fortunately does not vary the world over. The idea is, the intelligent gardener has charge of all plantations, even that of the well kept beer garden."

STUDIES AT REUTLENGEN.

The next place visited was the private pomological institute of Dr. Edward Lucus and his son, Frederick, at Reutlingen, in Wurttemberg. Here, at the foot of the Swabian Alp, where there is a cold slate soil and the position shut off from the warm winds of the gulf stream, making it a trying place for growing fruits, the Professor obtained lists of apples, pears, cherries, plums, etc., adapted to climates with hot and dry summers and very cold winters, which he hopes will prove valuable. He was furnished at this institute with maps of the most profitable route to proceed on his tour of observation northward, and with valuable letters of introduction to northern pomologists and foresters.

PEAR GROWING.

"In the matter of pear growing we have here obtained some very valuable information. The choice Flemish and French pears fail here about as completely as they do in Iowa, yet they have a class of thickly-leaved pears hardier than any of the apples grown, excepting a few Russian varieties and a few winter sorts, plainly of Astrachanica origin. A few of these pears, Dr. Lucus assures us, are choice for table use, but the ones most defiant to wind and weather, are only valuable for cooking and perry making. A silvery leaved variety grown here on mountain and valley for perry will prove a valuable stock upon which to grow better varieties. Top working on this stock is here very common.

HARD WINTERS OVER THERE.

"I had not expected to find the climate so severe at this point. The apple trees in the valley look hard from the effects of the unprecedented winters of 1879-'80, of which I have before spoken. On the thousands of acres of orchards around Reutlingen, in the valleys, there is this year scarcely a show of fruit of any kind on account of late spring frosts. On the mountain slopes, where the 'air drainage' is better, the fruit is abundant."

NO BLIGHT IN EUROPE.

Passing in his northward and eastward journey, onward toward Russia, and commenting on the condition of the country, its pomology and forestry, he says:

"In connection with these hasty notes, I might note the fact that no trace of blight of pear or apple trees can be seen in Europe. We have all kinds of theories as to its cause with us. Over our meandering path through France and Germany we have met exceedingly varied climates. We have been in sections where trees of all kinds have been injured by winters cold to an extent I never knew in Iowa, and in sections where the fig was hardy in the open air. Yet in all the varied sections we have found no place where the maize, the tomato, the alternanthera, the coleus, and other plants requiring a high summer temperature, reached the perfection they attain on our prairies. On the north side of the mountain range we have, indeed, lost sight of plants of this character, until we reached the valley of the Danube. Join our semi-tropical summer with the fact that we must plant trees that will *endure a Russian winter*, and we can readily guess why *we* have blight, and France and Germany do not know such a thing."

A VALUABLE LETTER FROM DRESDEN—HORTICULTURAL SCHOOLS OF
CENTRAL EUROPE.

"DRESDEN, July 27.—For the past week we have been giving attention to the work done at some of the special horticultural schools in northern and eastern Austria. Of these the one located at Klosterneuberg, near Vienna, and the one at Troja, near Prague, in Bohemia, deserve special mention.

"They are both called Royal Pomological Institutes, and receive about \$70,000 annually from the government to keep up the museums and the varied divisions of experimental work. They are in charge of men who by birth and education are specially fitted for the work. For instance, Dr. Rudolph Stoll, the Professor of Horticulture at Klosterneuberg, acquired his knowledge of theoretical and practical horticulture from his father, who, for over a quarter of a century, has been the Director of the Horticultural Institute at Oppeld in Silesia; who in turn was the son of one of the ablest horticulturists of the time of Van Mons.

"Dr. Stoll is not only an able manager of his division, but is an enthusiast who cannot do too much for those who visit the school seeking horticultural light. When we came on the grounds he was in the field directing a class of twelve young men engaged in training espalier apple trees. At once he delegated the work to an advanced pupil, and entered heart and soul into the work we came here to do. For ten hours he gave his time and ability to the

special divisions of the work and experimental grounds in which we were most interested, which of course was a study of the wax casts of fruits, and the trees of varieties and species specially adapted for healthy growth in climates with hot, dry summers and cold winters. We found the facilities for study unexpectedly good. For instance, in the great collection of apples we found, more or less in bearing, many of the varieties we grew in Iowa, as well as the leading varieties of all central Europe. We specially asked him to indicate varieties of winter apples of good size and quality which would endure a temperature of 27° Fahrenheit. At once he said our American varieties like Porter, Jonathan, Grimes Golden and Dominie would not endure such climates as portions of Bohemia, Hungary, Silesia and Transylvania; nor would still hardier varieties, such as Golden Russet and Belle de Boskoop. He then in rapid succession took us to trees which were grown successfully where trees we call hardy in the central district of Iowa utterly failed. Among these were four or five late keeping winter apples from Transylvania of wholly a new race. The leaves are thick, peculiarly serrated, and plicated like *viburnum plicatum*, or *rosa rugosa*. Two of these, named red and white Batulin, he mentioned as among the best in size, quality and appearance, of the late keepers. He gave a list of winter apples, desirable in all respects, of about fifteen varieties, none of which we knew except two or three selected from the list received from Moscow, Russia, by the Iowa Agricultural College. This list will be given after we have compared notes carefully with horticulturists on our road northward, as will also the list of extra hardy pears, etc. We place rather a high estimate on the Doctor's opinions of the relative ability of varieties to stand the heat of summer and the cold of winter, as he has made this question a special study, as has his father, and they both have visited the orchards and fruit exhibits of about all portions of northern Europe.

"I have only time to add that the object lessons in all the processes of horticulture, in utilizing fruits, in fighting insects, in illustrating the nomenclature of fruits, etc., will not, I am afraid, be equalled in Iowa for the next century. We went to Bohemia and Saxony to study the cherry question. Peculiarly *they are the countries* where the hardier forms of the cherry are grown on a great scale. It is one of the strange and unaccountable facts that we have been confined to the Early Richmond, Late Richmond, and English Morello cherries, when on the great plains of Bohemia and Saxony a dozen varieties are grown hardier than any we have,

except, perhaps, the English Morello, and as large and beautiful as any cherries grown in the Eastern States.

"Yesterday, on the grounds of the Royal Pomological Institute near Prague, we had an opportunity to taste the fruit fresh from the trees of many varieties likely to prove very valuable with us. The special hardiness of these trees will be carefully studied as we go north, as we shall keep ahead of the cherry season at points like Warsaw, Riga, etc.

"As we go north and east, the dropping out of tender forms from the botanical gardens, parks, and fruit gardens, is a matter of special interest to us.

"At the horticultural schools we are assured that we are the first persons, to their knowledge, who have made a comparative study of the fruits, trees, plants and shrubs of the interior portions of Europe on different parallels of latitude and at different elevations."

HORTICULTURAL SCHOOL AT PROSKAU, IN SILESIA.

"We are still working northward and eastward. For two days we have been studying the grounds, appurtenances, course of study, etc., of the most complete and instructive horticultural school we have yet seen in Europe or America, and it seems located where ordinary tourists would not be apt to find it. Far into the interior of one of the largest steppes of central Europe, on the 51st parallel of north latitude, six miles from any railroad station, but near the small, ancient town of Proskau, is the '*King's Pomological Institute.*' The grounds contain over three hundred acres, quite a large part of which is covered with arboretum, which includes a beautiful approach from the town, one mile in length—gardens, nurseries, orchards, beautifully laid out and planted lawns, etc. What is called the arboretum really contains about every tree and shrub of the world that will grow in this northern prairie climate. I say prairie, as this slightly undulating plain north of the Carpathian mountains is apparently as boundless as those of the west. We passed over it two hundred miles from Dresden in coming here, and it extends much more than two hundred miles eastward, and north-east it meets the Russian steppes. In northern Silesia this plain is very fertile, and is under high culture. The expression is peculiar, as we see no houses, only as we catch glimpses of distant villages, and we see no fences, no loose stock of any kind, only now and then a flock of herded sheep on the stubble fields or meadows. The division lines and roads are planted with trees, usually of low

growth. Poplar is much used, but the tops are cut back so as to present miles of neat, round topped trees even of the Lombardy poplar. For a road tree the *Morello cherries* are extensively planted. Lines of them may be seen on every hand which are lost in the far distant view. Lines of cherry trees, fifty or more miles in length, are said to exist on this great prairie along the road sides."

CLIMATE OF SILESIA.

In climate it approaches quite nearly our Iowa prairies. Its summers are extremely variable in temperature and humidity of air. When the winds are from the arid quarters they are excessively hot and dry. Singularly enough, however, the south wind of summer is cold and dry, and the northwest wind gives the most moisture and rain. The winters are as cold as ours, but rather more even in temperature. Some things are grown which fail with us. In sheltered situations, the Box, Mahonia, Ligustrums, etc., survive, while under the most favorable conditions the ordinary mulberry of the south fails, as does the osage orange, the catalpa, the Alanthus, etc."

FRUITS OF SILESIA.

"Pears are more grown than with us, but the varieties are hardier than those we have failed with, and the foliage of *these* indicate rougher usage than they would have in our climate.

"In apple growing the climate and soil are far from favorable. While favorable for most cereals and grass, the prairie is too wet for best success in orcharding. With such varieties as Jonathan, Dominie, Willow, or even Ben Davis and Walbridge, they would utterly fail to grow apples here. The list resisting the climate, and doing well on this soil, is not an extensive one, and it contains some of the varieties of the Russian steppes. The fight has been at the school to exclude from the experimental orchards all varieties low in quality. Hence it is an *omnium gatherum* of the varieties of good quality known to the prairies of central Europe. Dr. Stoll, the Director, has given his life to experimental work here, and his opinion of the relative worth and hardiness of varieties of fruits, has much value. He has given us a list of about 25 varieties of winter apples which have stood the test winters most perfectly in trying positions, all of which are worth trying in Iowa. His select list of pears, cherries and plums, we also consider valu-

able. But we propose to still farther sift these lists in sections where the summers are still dryer and hotter and the winters colder.

* * * * *

"For the prairie States it is unfortunate that all importing worth noting has been done for the benefit of the humid portions of the Eastern States, and the great West has utterly neglected to *row her own horticultural boat.*"

OFF FOR THE POLAND PRAIRIES AND NOTES FROM RIGA.

Closing up his notes from Silesia, Prof. Budd says: "To-morrow I take a three hundred-mile ride over the prairies of Poland to visit more northern collections at Warsaw, Riga, etc.:"

NOTES FROM WARSAW.

"Horticulturally Warsaw leads all Poland. In park, garden, and nursery, trees have an expression of luxuriant health which is not seen at Vienna, or at most horticultural centers. This is in part, due to the rich alluvial drift soil, but largely to the judicious selection of species and varieties. Some people have an idea that a very beautiful park cannot be produced in a climate where the summers are as variable in temperature and humidity as here, and where the winter temperature sometimes reaches thirty-five degrees below zero Fahrenheit. Indeed with us *it is* yet difficult. Here the country is very old and hardy varieties have been developed and collected of many species we consider tender. For instance, the grand old lime trees, poplars and horse chestnuts we see here along the avenues grouped with rare skill as to effects with other trees in the parks are wholly different in leaf and habit of growth from those met with farther south.

The magnificent and well-kept botanical garden illustrates this to still greater extent. Many Chinese plants are hardier than with us, mainly, I think, on account of the source from which they were obtained. Ours came from the Eastern coast, from Canton to Peking, while the Russian forms came from the interior, and often from the north and west slopes of the Himalayan and Altai ranges. We have had some experience of this kind with Rocky Mountain conifers. Species from the Pacific side, obtained from England and France, were tender, while the same species from the eastern slopes, have been perfectly at home with us. Every move we make

here strengthens the opinion that the prairie States have lost hugely in failing to look up the trees, shrubs, cereals, grasses, etc., of the inter-continental sections of Europe at an earlier date.

As it now is, it will take a long time to make the desired change. Nurserymen and planters will adhere to the old varieties and species until the ongoing years have demonstrated by actual trial the merits of the new on varied soils and exposures. But the time will surely come when the northern forms of fruits, etc., will supersede nearly all those now recommended by our horticultural societies. The careful and systematic observations we are making of climate, soil, and varieties, will, I hope, hasten the time for making some desirable changes.

The imperial gardens are now used for a fashionable park. At sundown it is swarming with well dressed and cultivated people. In its variety of expression and perfect keeping, it is not excelled by any public grounds we have seen in Europe.

The Imperial School of Horticulture deserves special mention. It has only about sixty students, but a strong teaching force, good buildings, cabinets, etc. Its gardens and experimental grounds are of great extent and better kept and managed than most of those we visited in Germany. We had here a grand opportunity to study the cherries best adapted to northern culture. We specially found one variety from the north which my friend Gibb called "a glorified Ostheim." In habit of growth it is like the Ostheim and the Vladimir of the north, but the fruit is from large to very large, and decidedly good. I predict that it will become a very popular variety when known in northern Iowa.

The Ostheim we have found all over central Europe, and it extends as far north as Moscow, in Russia. It is nearly sweet, and as grown in the grounds of the peasants of Poland, it is a mere shrub. It will prove very valuable on our northern prairies where the early Richmond fails. The Vladimir is of the same dwarf habit, and grows fully as far north. It is also subacid and superior for eating to our Richmond.

We had also at the institute a fine opportunity of seeing a number of varieties of Russian apples and pears in bearing. A number of the Russian apples are extensively grown here for profit. They are all of large size and some of them are as fine in texture and flavor as the best German varieties. To a considerable extent some of the strong growing Russian apples are used as stocks on which to top-graft the popular German sorts which are not quite hardy.

The Russian pears are mostly large in size, but not of number one quality for eating. They are, however, profitable, as they are best for cooking. Three or four of them are, however, excellent for eating. Among these is the *Sapieganka*, which is now (August 3) in fine condition for eating. Some of the largest and best bearing trees we have seen in Wilna and other points in Russia were of this variety. At Wilna we saw trees nearly two feet in diameter, loaded with fruit, while varieties like Flemish beauty utterly fail.

I should say a word about the fine botanical garden at Warsaw. Every town in Europe of any pretension has its well managed botanical garden, but Warsaw has one of the very best. Amid the wars and turmoils of poor Poland this garden has seemed to have no backset. The inter-continental sections are here represented more fully than we have seen in any garden this side of Kew. These botanical gardens of Europe have done a work which America should try to copy in the near future. We see here everywhere better specimens of our own trees than we can show. How is it on our soil with the fruits, trees, shrubs, grains and grasses of intercontinental Europe? Have we a first-class botanical garden in America?

But our time is up for Riga, Russia, to which place we go to study one of the largest nurseries, found as far north on the continent as parallel 55 of north latitude."

NOTES FROM RIGA.

"As Riga is near salt water and on the lower arm of the gulf of Riga, its climate might be supposed to be too moist and cool to interest the Iowa horticulturist. But in winter and summer the east and northeast winds are common, *and in all cases are dry*. In winter these dry winds often come at a temperature of 35 and 40 degrees. Hence only the trees and shrubs can be grown which will endure extreme changes of heat and cold, and aridity and moisture of air.

"In the fine parks on the avenues, and in the nurseries and fruit gardens of C. H. Wagner, we find no tree or plant that will not endure the roughest usage. Even the American Black Locust, which is the most common deciduous tree of central Europe, is here lost sight of, while the northern Elms, Lindens, Birches, Alders, Caraganas, Poplars, Maples, Hornbeam, Crataegus, etc., assume new forms." * * * * *

FRUITS OF THE GULF OF RIGA.

"Of course we have given a special attention to the fruits grown here. The pears grown most successfully near the city and in the interior of Livonia are all of the thick leaved type grown at Moscow. A cooking pear seems as hardy as the Siberian Poplar. Its Russian name we are told means *Pound pear*. When kept in the house properly it is said to be a fair eating pear, but rather coarse in texture. The *Sapiegaucka* pear attains great size, and is the most popular summer variety for eating. Twenty-eight other varieties are grown extensively in the nurseries here for shipment to various points in the interior, all of which, Mr. Wagner says, are hardy enough for the 55th parallel in the interior. Of these we will get a more decided opinion as we study them in central Russia, where the summers are very dry and hot. Prominent horticulturists and agricuturists are now at Moscow. At Warsaw and here letters are continually received from Moscow, saying it is intensely hot there, while here it is dry, clear and deliciously cool for a morning or evening drive.

"The varieties of the apples most extensively grown in the large nursery here for the far interior are true Russians. Only seventy varieties are grown, and the list has been very carefully selected. Mr. Wagner assures us that all of them, except *Livland* and *Red Stettiner* are hardy in the interior, and in my opinion the two trees named are hardier trees than any winter varieties we have. But I will be more positive on this and many other points if we have good luck in a month, or more, hence. The great cherry in the market here is the *Ostheim*. Hundreds of bushels are sold here. It is the peasant cherry of Livonia. It is really a rich, satisfying variety. A number of larger Morellos are grown, but none of them equal the *Ostheim* in quality except the *Brusseler Braune*, which I spoke of at Warsaw and Wilna as the *Glorified Ostheim*.

"Some northern forms of the filbert have attracted our attention, which are likely to do well with us. We also find here a northern form of the Bird cherry, which is used for a stock for the hardy cultivated varieties. If the stocks can be secured it is just what we need, as it does not sprout as do our Morello stocks.

"The pear stocks used here are grown from the wild pears of the country, and seedlings can be obtained at the large nurseries. This we hope will obviate the difficulty we have experienced in using French stocks."

PROFESSOR BUDD AT ST. PETERSBURG.

Of the Imperial gardens, I can only say at this time that under the able management of Dr. Regel, they have attained a proud position. The doctor is now sixty-seven years of age, and has had charge of these gardens for twenty-six years. Before coming here he was director of a botanic garden in the mountain regions of Switzerland. He is probably the ablest botanist in northern Europe. He is really a walking encyclopædia striding over the grounds and talking of the 24,000 species of plants under his charge. We tried to keep up with him for six hours yesterday. We did not observe that he was tired, but we freely admitted that we were. Some idea of the magnitude of the place may be inferred from the fact that the large glass houses, if placed end to end, would extend two English miles.

DR. REGEL'S NURSERY.

Dr. Regel, in company with a business partner, has an extensive nursery about two miles distant from the gardens. This nursery is in one sense also a botanical garden. Plants are grown quite largely, of little known species of northern Europe and Asia, for distribution to botanical gardens, private collections, etc., in all parts of the world. Fruit trees are not largely grown. Indeed the soil here is not favorable for growing of fruit or fruit trees; yet here are found very many varieties of the apples of the hardiest known varieties.

A SHOT AT OUR AGRICULTURAL DEPARTMENT RUSSIANS.

The German varieties in stock when the scions were sent to our Department of Agriculture in 1870 were long since discarded. The sorts now grown are true Russians, which can stand rough usage.

MARKET FRUITS AT ST. PETERSBURG.

Some of the fruits in the market specially interest us. The Russian summer apples are fine in size and color, and run into many variations in texture and flavor. Some of them will prove as valuable as our Duchess of Oldenburg and much better quality for dessert use. The market is supplied with cherries to an extent not observed before in any city of Europe or America. These cherries come from the far interior provinces of Vladimar and Samara, where the climate is dry and hot in summer and the winters are even more severe than with us. Though they vary in size and quality they are all of the same dwarf tree race, and are known un-

der the generic name of Vladimir cherry. They are not true Morellos in fruit, leaf, or habit of growth. As near as we can learn they came from the slopes of the Altai range. One of the varieties strayed in some way into the mountain regions of Spain, from whence it went north into Germany and Poland under the name of Ostheim. From the latter come the variety known as Brusseler Braune, which is the largest of the class in fruit, yet hardly equal to the others in quality for dessert use. We shall study these varieties at Vladimir later.

AT MOSCOW.

Horticulturally it is a new field. The climate is much like that of the south half of Minnesota.

* * * * *

In the way of fruits we only find the hardiest known forms. The cherries grown are of the race known as *bladimis*, some forms of which have strayed into Germany, where they are very popular.

No varieties of the plum are grown except of an Asiatic race, which seems perfectly hardy. The fruit is superior to our best wild plums in solidity of flesh, but not in flavor. The normal form seems *red*, but yellow and black ones are seen here on every street in great quantity. I think it will prove valuable if not destroyed by the curculio. I say this, as it ripens very early in the season. The fruit of all the varieties is oblong, with a deep and peculiar suture on one side, like some peaches. Some of the choice varieties of this race ripen, it is said, later in the season.

We see nothing in the shape of grapes, except on walls and in glass structures, though at St. Petersburg we saw, in open air a species from northern Asia closely resembling our *Labrusca*.

Of currants we find here a new race, with black and red fruit, *decidedly sweet*. It is labelled in the botanical garden *Ribes Albina*. The fruit of one variety seen here is as large as the cherry currant. It is not prized, as the currant is mainly used for sauce and jelly. For which the common form is preferred. Many Americans like sweet fruits, and would think this new race valuable. Certain very hardy sorts of the pear we have been following northward, but we are sorry to hear them reported tender at Moscow. But we need not despair, as where the Poland pears *are lost*, a still hardier race *is found*. Most of these far north pears are very early in ripening, and not considered valuable. They are now in the market from the sparrow hills, near here, and we find them to

compare favorably with the very early pears further south. One of the best autumn pears grown here for dessert use is known as *Bessemiauka*. The tree seems hardy as a willow, and perfect specimens are seen in the gardens trained into forms which only iron-clad sorts will endure. Our observations indicate that very good sorts of the pear grow further north than first-class apples.

It is too early yet to decide on the quality of fall and summer apples. The streets are full of summer varieties of fine appearance and good quality, considering it is only harvest time here. Our German friends tell us that many of the autumn and winter varieties compare favorably in size, appearance and quality with the best German sorts. Of this we will judge later. Moscow has too rough a climate for profitable orcharding, except in certain lines and on certain soils.

As we have supposed, Iowa climate is found considerable south of Moscow, from whence came some of the sorts now started on the grounds of the Iowa Agricultural College Farm; yet a few varieties seem like our Oldenburg, to grow and bear well over a wide range of climate and soil. As an instance, the *Antonooka*, we hear of in every part of the Russian empire. Yesterday I was talking with men attending the Forestry convention from the extreme south of Russia, north of the Black Sea. They report this omnipresent variety one of the most profitable there, and it is so reported 600 miles east of Moscow. On the other hand, good winter varieties are reported doing well on the limestone formations of the Province of Kazan, but utterly fail on the tenacious clays south of Moscow. Still again, some varieties of the Russian form of the apple do best on the deep black soils, and are worthless on the limestone, or the stiff clays. Of all this we will try to take careful notes before we leave interior Russia.

We spent two hours this morning in the botanical garden to which we had given a prior visit. When we consider that the climate is too difficult for any form of our locust except the *caragand*, and too difficult for our soft or hard maple, butternut, and even box elder, we might expect a slim showing of trees in a large botanical garden. But the doubting ones *should come and see* to get an idea of the rich flora of the almost unknown world in the northern portions of the eastern continent. By means of seeds and plants we hope to get many trees, shrubs and perennial plants, which will swell the iron-clad lists of the prairie States.

ON THE VOLGA.

I am now afloat on the Volga for a trip to Kazan, about 500 miles east of Moscow. Nishny is nearly 300 miles east of Moscow, and is a central fruit market, as it is indeed of about every known commercial product. Boat load after boat load of apples lie on the wharfs subject to the inspection of purchasers. Mr. Stockwell kindly went with us to interview the growers of these fruits, who always seem to accompany their assignments. To ascertain the real commercial varieties of the North Volga was our main object. In fruit growing the Russian is a creature of habit and a close follower of the habits of his forefathers. This tendency is bad enough in south Europe, but it is intensified here to a degree often painful to the versatile American. For instance in the immense province of Vladimir, east of Moscow, the whole province is given to growing the cherry. Hundreds of proprietors have orchards of ten thousand trees (or rather bushes), and the products are shipped to every part of the empire.

PLUMS AND CHERRIES AT 50° BELOW ZERO.

In the cherry season, Vladimir cherries are plenty and cheap in every Russian city reached by railroads or water. We are told that whole trains are loaded with them for Siberia and the far northeastern cities of the plains. South of Vladimir, but still near to the 50th parallel where the thermometer reaches at times 50° below zero Fahrenheit, is grown the plum in quantities absolutely immense. These plums vary in season and color, but they are all of one race, which seems indigenous to northern Asia. Many of the varieties we met at Nishny are equal to the best German prunes, which they resemble in shape and texture of flesh. The color is usually red, and the *suture* at one side is peculiar to the race.

SOME OF THE APPLES HE WAS LOOKING FOR.

As we go south (or rather east on the Volga) we reach the apple growing districts, not because the soil or climate are better than in Vladimir, but because the people happened to drift in the early ages in this direction. One of the large orchardists who brings fruit here by the barge load, grows only four varieties specially suited for the Nishny market during August and the first week of September. These varieties are (1) *Borovitsky*, a large oblong variety with crimson stripes. In quality and appearance it is

superior to our Duchess. (2) *Miron Krasnui*, an early variety, now past its prime. It is showy, mild in flavor, and much eaten from hand by the Russians, who do not like acid apples except for cooking. (3) *Titofka*.—This is not our *Tetofsky*, but is a very large, oblong, ridged, highly colored, and really good variety. Many of the specimens look so much like large specimens of Benoni as to deceive the expert. The flesh is pinkish white, somewhat coarse, but breaking, tender, juicy, and pleasantly subacid. This variety seems popular in all parts of Europe. (4) *Summer Aport*.—In Russia are grown four Aports, three of which are late autumn or winter. The one now in market on the Volga in immense quantity is known at Moscow as *Aport Oseniiai*. It is large and highly colored with splashes of pink and crimson. It may always be known by its one-sided stem and lip, something like Roman Stem.

Other growers have other varieties, some of which are purely local. For instance we talked with a man from a point east of Nishny, who grew only one variety, of which he had a boat load in the market. No other apple man seemed to know of it, nor is it in the Russian catalogue of fruits. He calls it *Rachnanka*. It is large, bright yellow, even in size and color, and fine grained. In appearance and quality it is superior to our Coles quince.

We took many pages of notes in the Nishny market, and from very intelligent apple growers of the upper Volga, at least 1,200 miles from the Caspian. We are much pleased with the general expression of the fruits in the market. As yet our studies are of course confined to the summer varieties, and to getting the opinions of growers and consumers as to the best known winter sorts. Later we will decide many fruits as yet uncertain.

THE PEARS.

The pears of the Volga are better than we expected to find. It is well known that the pears of early summer are not equal in quality to those of autumn ; yet we find some varieties decidedly good for dessert, but in no respect equal to our best varieties, such as *Seckel*. We now recognize Russian pears at sight. They vary in shape, but some peculiarities of stem and calyx always are present.

THE BORDER LINE WHERE EVERYTHING GETS MIXED.

After spending one day at the great Fair at Nishny Novgorod, no one will wonder that Chinese fruits find their way into Russia.

For ages it has been the barter point where oriental products are exchanged for those of the west. Singularly enough this is not done by proxy. *In person* we have here the peasant, and the persons high in power of *every* oriental race and tribe. The collection of products and people will live with me as a dreamland picture while memory lasts.

MORE ABOUT THE FRUITS OF THE VOLGA REGION.

To return to the Volga fruits I will say that the steamers run from Nishny to Astrachan, a distance by river of 1,400 miles, and of course the fruits of even Astrachan are found at Nishny, but the number of days required by the boats to reach the head waters make it less desirable to ship the summer fruits so far, yet where we get sight of the Astrachan fruits they are of the Chinese and Russian type. The steppe country really reaches the *Caucasus range* on the south, and the northerners of winter are low in temperature when they reach the Caspian, *and dry* as those of our northwest winds of Iowa. Hence the fruits in all the windings of the Volga may be counted better able to bear the summer heats and the winter blizzards of Iowa than those of south Europe.

We stopped a few minutes ago at a village on the side of the *loess* bluff of the Volga for an hour. Of course we had a peep at the fruits and trees. We found the huckster women peddling an apple we met at Nishny, which looks like our Fameuse. If mixed with well colored specimens of the latter grown in Iowa, it will require an expert to pick it out. But in reality the flesh is yellowish white, and very nearly sweet. It is juicy and decidedly pleasant for a summer-eating apple. We are told it is extensively used in Russia for baking and boiling. Here its names are local. I will try to identify it later, if known in the Russian fruit books. We have a place for such an apple. The blackberries, huckleberries and cranberries we see here are wholly unlike those of the United States. I should also state that the plums and cherry trees are not grown in tree form any more than are the gooseberries and currant. They are really *large bushes* with several stems from the roots. The pruning is done by cutting out the older stems, as the *most* and the *best* fruit is found on the younger offshoots. Really these northern cherries and plums are large *shrubs* rather than *trees*, but very desirable in fruit.

KAZAN AT LAST—ITS MANITOBA CLIMATE AND "MICHIGAN" APPLES.

The climate of Kazan I fail to comprehend. That its winters should be cold we could readily guess. In extreme winters the mercury congeals and the mildest winter has periods when the temperature reaches thirty to forty degrees, with a very dry air and a great uncertainty as to the time when the first snows cover the ground. Sometimes great damage occurs, even in the forests, by extreme low temperature in December, with no snow on the ground. Irregular and very severe winters we might expect, but the summer conditions are less easy to understand. For instance, the Volga opens and closes about the time our records show on the the Mississippi at McGregor, and the aggregate summer heat is about that of northern Iowa. Yet Kazan is on a great interior plain twelve degrees north of Des Moines.

Combine this fact with the extreme aridity of the summer air, the tendency to drought, and the very low temperature and variable air of winter, and we have conditions very similar to those of northwest Iowa, *only more severe*. Yet without exception, all the villages we visited are literally *amid great orchards* with fine looking, and really *very good* apples. To find such extensive orchards in the far interior and far northern province of Kazan, surprised us as much as to have found them in Siberia. Even at Moscow we were told that but few apples were grown so far north as Kazan. I wish I could have a delegation of about one hundred of the intelligent farmers of northwestern Iowa here for one week to go with me over the ground I have traversed in this district. I have seen hundreds of orchards literally loaded with finer, smoother fruit than I ever saw in central Iowa, growing on an *even lot of healthy, hardy trees*.

The inspection of such a delegation would do more to convince the people that we must *quit fooling with the south of Europe fruits* than my talk will do in forty years. But I find the facts to far exceed my expectations.

We find much trouble in the identification of varieties. Widely separated localities have different names for the same varieties, or wholly a new set of names not known perhaps fifty miles distant. But one thing is much in our favor. The late keeping varieties are transported long distances by rivers and railroads, and have acquired commercial names. The summer varieties are too numerous to attempt a system of classification, only with a few favorite sorts. The winter varieties we will be able to study in a satis-

factory way, and to identify with absolute certainty. So far we have not seen a winter variety of free, upright growth in nursery or orchard. In large proprietor orchards planted thirty years ago, the largest trees are only five inches in diameter, and can be planted as closely as dwarf trees are planted with us. Really they all belong to a *dwarf species*. Last winter Senator Larrabee stated at the annual meeting of the State Horticultural Society, that he had received some Russian trees from the Agricultural College, but he did not like to plant them as they were too small and scrubby. I tried to explain that it was not the fault of the grower, or the ground on which they were grown, but that I believed the Russian winter varieties belonged to a dwarf race. While here among the dwarf orchards loaded with fine fruit, I wish to impress the idea that we must not reject the Russian apples *because they fail to make nice trees in the nursery*. We grow fruit trees for fruit, and our friends may rest assured that the future orchards, giving profit to their owners, of northern and central Iowa, will be planted with true blue Russian varieties, such as are grown in central Russia.

Many of the summer varieties of the Aport and Oldenburg type grow more freely when young, but none of the full bloods found here become large trees. I have now doubts about the Duchess being a full blood Russian. We find here many varieties much like it in tree and fruit, but none of them are as coarse in flesh, as acid, or as strong in growth of tree as the latter. In Germany and Poland we found varieties more like the Duchess than we find here, but they are plainly crosses with the true Astrachanica. Some of the Aports of this section are large, highly colored, good, and keep well into winter, as they would in northern Iowa. Four kinds of Anise are grown for winter use varying more in color than in size and quality. In size they are about like Jonathan, but in form they resemble large sized Winesaps. None of the true winter apples are larger than the Ben Davis, and most of the longest keepers are not larger as grown here than the Jonathan. We find the Russians are quite fond of juicy sweet apples. As a rule the apples brought us to eat in the Russian villages have been bright red, juicy, sweet varieties, which will prove valuable with us; yet the favorite winter varieties are here all mildly subacid. I do not think of a decidedly sour apple that I have tasted in the province of Kazan.

STILL ON THE VOLGA—FRUIT AROUND SIMBIRSK.

SIMBIRSK, RUSSIA, Sept. 3.

We have spent three days in examining the fruits in the many orchards in and near to the famous fruit city of Simbirsk. It may be more properly named "The Orchard City" than any town we know of in Europe or America. Literally every available spot in and around the city is planted to apple, pear, cherry and plum trees, all of which this year have produced great crops of really choice fruit. But not a single variety can be found that belongs to the races of fruit found even in north Germany. The climate is very trying both summer and winter. The city is located in the dry steppe region, 500 miles east and a few miles south of Moscow.

The air is very dry, and during the day excessively hot. On account of the rapid radiation, the nights, however, are decidedly cool, yet not too cool to prevent the ripening of tomatoes and first-class melons. There has been no rain here for the past seven weeks, and everything would long ago have been parched were it not that the black drift soil will stand long-continued drouth. The winters are colder than in any part of Minnesota, that is, the extreme winters which come, as with us, at intervals of from six to eight years. In 1877, for instance, the temperature the last of December reached 50° Fahrenheit, with very little snow, while last winter was very moderate with very heavy snows.

Thousands of acres of orchard here are planted, with a very few commercial varieties of the apple, which do not differ materially from those grown in the province of Kazan. The trees are small in size and bushy in habit of growth, but loaded with very showy and excellent fruit. Could our friends at home drop in our hotel room at this moment they would see every stand and table loaded with very fine specimens of apples, pears and plums. Of the cherries we took leave at Kazan, yet a few specimens of the late varieties of the indigenous race are yet found in the thicket-like cherry orchards. I say "thicket," as the trees are merely large bushes, and they are grown so very closely that their branches must be pushed aside to get through them. The plums are also dwarf in form, and grown very closely together. There are many hundred bushels of red and blue plums now on the trees, and the early sorts have been marketed. The fruit is much like that of the German prune in firmness of texture, but the red varieties are much sweeter. The blue sorts are not yet ripe, and we cannot judge their quality, but we are told they sell best in the market. We find in the bor-

der of the timber the native forms of the plum and cherry. The wild plum is bright blue, small, and the little shrubs, three feet in height, are so loaded as to make them decidedly ornamental.

In this hasty letter, written, as usual, on short allowance of time, I wish to speak specially of the pears of Simbirsk. Many thousands of trees are found growing under exceedingly varied circumstances. Some pear orchards slope to the east, and many to the south, west, and north. Some are on cultivated ground, the most are in stiff sod, and very many are found in yards and even planted in the public park. Under about all circumstances they are loaded with fruit. But, as a rule, the fruit is not good. Ninety per cent. of the trees are seedlings of the Bergamot type, and the type of race known as *Grucha*. Thousands of busnells are dried for peasant use in the winter, or made into a kind of bottled sherry for the use of the more aristocratic. If proper facilities were at hand, the seeds from the pomace would be just what we need for the growing of pear stocks. As it is, they are chopped up in a rude mortar before pressing. We have, however, contracted for twenty pounds of the seed to be taken out by hand by the peasant women. Both races of the pear found here grow from seed with perfect uniformity. The leaves and fruit from 100 trees we found more nearly identical than would be the seedlings of our native wild crabs of Iowa. They seem to be indigenous races of the Volga region. The fruit is bright yellow, about the size of our Seckel, but too acrid to be relished by most people. The trees are hardy as the white poplar, and make beautiful street or park trees. The grafted varieties are only modified forms of the native species. Some of the Bergamots are large, nearly round, somewhat rough and knotty, and fairly good for eating, as are also some of the pyriform varieties of the *Grucha* race. We have not as yet tasted a single variety that equals in quality a well-ripened Flemish Beauty, but we are told that some of the autumn varieties, yet hard as bullets, are very good. We hope to find this true. But if we find that the grafted varieties are only valuable for culinary use, we have here a race hardy enough to grow on our most exposed northern prairies, even for windbreaks, or as a street tree. That we will find very good varieties in the real climate of Iowa farther south, we do not doubt. Even in this far north interior region we find great quantities of large-sized pears, first-class for cooking, and some of them sweet, pleasant, and fair for eating, but coarse in texture.

Taken all in all, we are surprised at the quality and quantity of the fruit grown in the steppe region 1,000 miles north of Des

Moines. We go now to a city 80 miles further south, where we are told the orchards are still larger and more numerous than here at Simbirsk, and where a greater number of varieties are grown.

To give an idea of the summer aridity and winter cold of this region, I will say that all the varieties of the apple of the Duchess and Apert classes are short lived and liable to be killed or badly injured by the test winters. Our Duchess we do not find, but the Borowinka and a dozen other sorts are so like the Duchess in leaf, tree, and fruit, as to be hard to distinguish only by tasting. All of the varieties of the Duchess type are finer in texture and milder in flavor than our Ironclad.

The true Ironclads have the leaf and habit of growth of the wild apples found native near the bluffs of the Upper Volga. The trees are low and scrubby in habit, but they are loaded with high colored and really excellent fruit. With the quality of the apples here called good, we have been much surprised. On our table at this time are apples approaching very nearly the quality of the Dyer and Rhode Island Greening. Mr. Gibb is very fastidious in his notions as to quality of fruits, and he continually expresses his surprise at finding so many really good varieties far north of the point where we had hoped to find them. Nor are these varieties short-lived, even on the black soil west of Simbirsk. We have been in many orchards planted thirty years ago, where few trees are missing from the rows. That these varieties of the apple, pear, cherry and plum will thrive on the bleakest prairies of northwest Iowa, we have not the slightest doubt.

OBSERVATIONS AT KNAVLINSK.

KNAVLINSK, RUSSIA, Sept. 5, 1882.

The town from which I write is on the west bank of the Volga in latitude 53 degrees north. In the vicinity, on black drift soil mostly, are very extensive orchards of the apple and pear, among which we have been roving under rather unfavorable circumstances. Here are varieties which have stood the test of winters for 70 years, and have borne this year large crops of very smooth, perfect apples. Without exception the five varieties of the *Anis*, everywhere grown in this region in immense quantity, are ahead on the score of health of tree and profitable bearing at all stages of growth. From this town we are told by the mayor, (the only man who speaks French, but who was too much occupied to go with us except to one very interesting garden within the city limits,) the shipments of fruit

have already reached this season about 1,000,000 pounds of 36 lbs. each. Thirty-six million pounds from one shipping point, with many others above and below, will give some idea of the extensive orcharding of this region. Yet the varieties grown are astonishingly few. The mayor gave us a list of 15 varieties of apples and pears, which included all those grown in quantity for market. In my judgment, after looking through the orchard, fully 75 per cent. of all the apples shipped are Anis, (five varieties;) Malit, (two varieties;) Blackwood, Winter Aport, Scrut and Zarsky Schip. The eight first named are good keepers here, and would be in northern Iowa. I doubt if any of them would keep longer than Jonathan as far south as Des Moines. The quality of all these is above Wall-bridge, and very much superior to Ben. Davis. The apple known as "scrut" in all this region, is everywhere the summer and early autumn eating apple. It is large, handsome, conical, striped, sub-acid, and seems to meet the popular demand much better than the many apples of the Duchess type, which are found in limited quantity in all orchards large and small. The Zarsky Schip is a fine-looking yellow sweet apple of really excellent quality for eating or cooking. The sale of this variety in the northern market at Nishny would astonish our people who will not look at a sweet apple. If it will grow as handsome rich and juicy with us, it will be popular with our few lovers of sweet apples. Some of the later pears are now getting ready for eating, and we find some of the nearly round varieties of the northern Bergamot type decidedly good, but not quite up to well ripened Flemish Beauty. The hardness of these northern pears is surprising. The seedling varieties are used for street and park trees in the most trying situations, where even the northern poplars are now taking on the sear and yellow leaf on account of the long continued drought. It has not rained in many weeks. The sod of pasture and meadow is as brown as in November, and the air is dry, and the dust as fine as in the Sahara Desert, yet these dark foliated pear trees have every leaf perfect and show off finely in contrast with the white poplars with which they are often planted.

I write these lines on a window-sill at the wharf, while waiting for the boat delayed on account of the very low water of the Volga above here. As I look out, strings of carts are passing all loaded with apples, put in boxes, and made firm by cords skillfully drawn around them in both ways. At Nishny we saw thousands of these boxes filled with summer and fall apples in good condition for eating. They came out in far better shape than from our barrels.

The boxes are returned, as they will bear re-filling several times. The bark from which they are made, is stripped in June and pressed in flat sheets before drying. We have watched the making of these sensible boxes with much interest. The boxes from willow bark are also used, but are not strong enough to pay to fill the third time.

THE FRUIT AND CLIMATE AT VOLSK.

VOLSK, RUSSIA, Sept. 9.

We have been tiring ourselves out in the old work of rambling through parks, gardens and orchards, near this ancient city of central Russia. We are on the border of the dry steppes reaching into central Asia. It has not rained here for weeks, and such comminuted dust we never know in Iowa, yet on our table we have such an exhibit of large, highly-colored and really good fruits as we can not gather at Des Moines. Yet, hot and dry and sunburned as the far-reaching plains now are, the winter temperature reaches 50 degrees Fahrenheit in extreme winters, often without a particle of snow. As a rule there is more snow here than in Iowa, but the time of the first snowfall of winter is very uncertain. Sometimes the lowest temperature is reached before the mantle of snow is spread. Hence only such fruits, trees or shrubs can be grown as will endure the heat and drought of a semi-desert summer, and a semi-arctic winter.

THE PROFESSOR STILL MORE ASTONISHED, AT SARATOFF.

SARATOFF, RUSSIA, Sept. 13, 1882.

This really beautiful city on the border of the elevated prairie or bluff on the right bank of the Volga (about 700 miles north of Ames) may also be called the Garden City. It is literally surrounded with great orchards. Within two miles of our hotel, in this city of 100,000 inhabitants, we visited to-day an apple orchard of 12,000 trees, which this dry year did not produce as great a crop as in more favorable seasons, yet 25,000 pounds (36 lbs. to the pound) have been shipped to Moscow from this orchard this season. Two years ago the crop sold was 85,000 pounds or 153 car-loads of 20,000 lbs. each. The proprietor, Mr. Patiskieff, has also a large pear orchard adjoining, which also proves very profitable. This orchard is only one of the very large commercial orchards near Saratoff. Ten versts distant is one nearly double the size of the one noted, which we did not visit as we were told it contained the same vari-

eties, and was conducted on the same general principles observed in the other orchards.

These very large orchards grow but very few varieties, all of which we are assured have been popular on the Volga for at least the past century. Ninety per cent. of the apples are of winter varieties, but they are nearly all sold and shipped early in autumn. This year the picking was earlier than usual, on account of the excessive heat and drought of the season. But a few varieties are yet on the trees of very late maturing sorts. Those who have believed that no late keeping varieties were grown so far north should examine the trees laden with Steklanka, Antoncoka, or Tchungkka. While ordinary winter sorts are finely colored and tender enough for eating—if one were apple hungry—these very late keepers are as hard and immature as is our American pippin in October.

The more we see of Russian orcharding, the more complete is our surprise. Not only are the varieties larger, finer looking, and better in quality than we expected, but the systematic management of the great commercial orchards exceeds our expectations. For instance, Saratoff is on the border of the desert. Since we have been here the air from the east has been dry as that of the day when Chicago had its big fire, and is filled to the point of suffocation with impalpably fine sand that penetrates the very skin. As far as the eye can reach the herbage is as dry as in December with us. On such seasons the orchards must be watered to carry the crop to full size and maturity. In the upper part of each orchard are great reservoirs filled by steam pumps owned by a company of gardeners. In time of need the water flows in wooden troughs—one row at a time—to every tree of the orchard.

GETTING DOWN TO BUSINESS, AND ANOTHER SHOT AT THE WASHINGTON RUSSIANS.

VORONESH, Russia, Sept. 17, 1882.

* * * * *

We visited Voronesh specially to see one of the Russian schools of forestry and horticulture, established about forty years ago. The extensive grounds are finely located. The broken grounds on the bank of the small stream here coming into the Don are included, while a large portion of the place reaches back on the rich alluvial drift of the prairie. While the forestry, the agriculture and other divisions of the work were interesting and should have had much

more time, we were compelled to give the allotted time here to the grand arboretum and pomological gardens under the special care of Dr. Fischer. The climate is very severe, on account of the hot, dry summers and the liability to extreme winters, when the thermometer goes down to -37 degrees Fahrenheit. The wide range of temperature and humidity, joined with the habits of growth of trees on this rich, deep soil, gives to the forty years of experimentation at this school a very great value. Yet, of certain excellent varieties of the apple and pear we find trees forty years of age with scarcely a scar to indicate their fight with the many test winters. We also find healthy and productive trees bearing good crops of excellent cherries and plums. But in all cases the varieties are those apparently indigenous to the far north.

As we consider Dr. Fischer very reliable in his nomenclature and opinions as to the relative value of varieties and species, we have ordered here quite a large bill of scions, plants and seeds. In most cases we already have small trees on the college grounds, the sorts of apple and pear which Dr. Fischer has found most valuable from experience and long observation. But as our means for positive and fixed opinion increase we grow more anxious to spread certain varieties more rapidly than we could do with the few scions now at our disposal. Hence we have ordered scions in considerable quantity of certain winter sorts of the apple, and really good varieties of the pear. Of the cherry we have ordered small plants of ten varieties of the Vladimir race, and a number of varieties of the dwarf indigenous plum of which I have spoken as growing in the far north in small shrub form.

The place also gives us a fine opportunity to give an order for many interior trees and shrubs which will prove valuable on our great prairies. In this department we can make a full order of things wanted for trial at one or two places, as the botanic gardens and the vigilant botanists have worked up this field very efficiently. But I cannot say this of horticulture. Dr. Fischer was surprised when we told him of the great orchards to the northeast, where varieties are grown in immense quantity which he had never seen. As an instance, in the north Volga section three varieties of the Anis are as nearly kings of the orchard and market as is the Antoonoka in this part. Yet Dr. Fischer had only heard that the Anis existed in some parts, but he had not seen it, and we have not seen it anywhere in this section. Horticulture in the various provinces seems a fixed quantity, as are many of the usages and customs. The work we are doing has not been done by the Russian Government

or by any society. Dr. Regel, fourteen years ago, got specimens of the apples of most of the provinces and published a book describing them as best he could. Had the book been followed by the organization of horticultural societies, and the active labors of such a horticulturist as our Downing, Thomas or Warder, the Russian nomenclature would now be in better shape. As it is we find a ridiculous confusion in names. Out of the confusion we will gather a few sorts which we know are defiant to wind and weather, and which will pass muster in quantity for home use or market. As a rule these are the great commercial ones of Russia, like Anis, Antonooka, Black Wood, Steklanka, etc. Literally the handlers of fruit in the markets have fixed the names in the Volga region for the east, and the handlers of fruit in a few large cities have fixed a few names for the west. Often the names in the east and west do not correspond, but our weeks of study will start us right on the Iowa prairies. With the help of correspondents we are able to establish in various places, we will be able to continue the work we have commenced in the field.

We find that the collection sent to the Iowa Agricultural College by Dr. Arnold, of Petrovsky Institute, included *nearly all the best winter varieties of Central Russia*. We also find the Washington list received from Dr. Regel at St. Petersburg, to include the names of some of the best sorts, but for some reason not one of these varieties were saved, or if saved, it has not been fruited to my knowledge in the States.* As a rule, this importation included the summer and fall apples of eastern Russia, near the coast, and a great number of German varieties with which Dr. Regel was then experimenting. To illustrate, the Antonooka is number 236 of the Washington list, but is number 78 of Dr. Regel's book. It is a strong grower in nursery, a tree that attains size and maintains health on any soil or exposure, and of all the varieties would seem the one to survive and fruit on American soil. If any one has fruited it I hope it will be reported. In color and shape it is like Grimes' Golden, but it averages much larger in size. So near is a medium specimen like Grimes' Golden in color, shape, basin, stem, and cavity, that an expert could not pick it out. In flesh it is some coarser, but it keeps much longer than Grimes and is nearly its equal in quality.

Of western and central Russia it is the king apple to-day over an extent of country equal to several of our States. Did the depart-

*NOTE BY THE SECRETARY.—A. G. Tuttle, of Baraboo, Wisconsin, has preserved a number of the true Russians, and expects to make a large showing of the fruit next fall and winter.

ment receive the true Antonooka, or was it lost? In discussing the winter varieties we have seen and tested, and the winter varieties specially recommended by Dr. Shrader, Dr. Fischer, and a hundred orchardists in various parts of Russia with friend Gibb, we got out the Washington list, hoping to find at least one of the specially prized sorts which had been fruited with us. We utterly failed to find it.

HIS REPORT FROM OREL.

As near as we can tell the climate here is about like that of the northern counties of Iowa. The black locust lives in an imperfect way, but is killed back in extreme winters, and no fruit of France or England will endure the most ordinary winter. Some of the apples and pears have German names, but this comes from the introduction of German gardeners as early as the reign of Peter the Great. I have before me three fine winter apples with German names, yet they are as truly Russian, we are told, as is the Borovinka or Anis. So, some of the pears have the generic name of *Bergamotte*, but where does this name belong? Karl Koch shows that it is truly of Chinese origin, and the primitive forms of the Bergamot are the most beautiful dark-foliaged trees found in the parks in the far interior and northern provinces of Vladimir and Kazan on the Russian steppes. Some of the improved Bergamots of Russia have possibly some admixture of southern forms, yet the leaf and habit of growth are more truly like the Bergamot race than any of the southern pears bearing this name. To-day we had the first opportunity to taste well-ripened fruit of the Bessemiauka pear. It is a true Russian, and the old trees here are hale and hearty, and have this year borne fine crops of fruit. Yet I am glad to report that the fruit is decidedly tender and good for dessert use. Uniformly we have been told—even by Germans—that the fruit was good, but we did not expect to find the specimens as perfect in form and flavor as those we now have on our own table. *It is one of the coming pears of Iowa.* We have ordered scions of this and other good pears from the Institute in considerable quantity. We have also paid for scions of a number of choice winter apples long grown in this vicinity. One of these varieties bears the name of *Borsdorf Zwebel*; yet it has a historic fame in the valley of the Olga as a fruit fit for the table of a prince. I wish to repeat that we are perpetually surprised at finding fruits of great excellence and value which have not spread far beyond the bounds where they have been grown for generations. Here at Orel we

find some varieties utterly unknown one hundred miles east, and at Veronish we found varieties not known on the Volga, while neither at Orel or Veronish were the most popular winter fruits of the Volga section known even by the directors of pomological gardens supported by the government.

For the first time we find here the form of mulberry which has been much lauded with us under the name of "Russian Cut-leaved." At Orel it is considerably grown, but it is not considered perfectly hardy. During extreme winter it is killed back, but it comes again, and bears much fruit in a brief time. The story of its use as a timber tree of Russia has no foundation. It is a small sized tree with shrubby habit of growth even farther south where it is perfectly hardy. Yet I think it will prove a neat ornamental tree on lawns, and will be worth growing for its fruit in a large portion of Iowa. We are ordering scions, plants, and seeds from various points in Russia, partly because we can only in this way secure varieties true to name, and partly because a division of the orders may secure safe transit for at least a part. In some cases we duplicate orders where we have doubts as to the identity of varieties.

OBSERVATIONS AT ANOTHER POINT.

KURSK, RUSSIA, Sept. 21.

This is another ancient city noted for its gardens during the past two hundred years. Literally within and around the city it is one great garden of fruit trees, where an available spot can be found for planting a tree.

* * * * *

The horticulture of this region is intensely interesting to us. It is the home of the wild apples and pears spoken of by Humphrey, Loudan, Lindley, Koch and other European botanists. In the forests we find the pear a common tree and as healthy and hardy as the indigenous oak. The isolated trees on the border have a cultivated look, and many of them bear fruit which is especially prized by the peasants. The apples also have a look of cultivated varieties with the thick, pubescent leaf peculiar to the Russian sorts. The fruit is not astringent, but small in size. As it keeps well, the peasants use it after it has been frozen. In isolated positions where the soil is good, the wild apples and pears attain large size. Whether they are truly indigenous no one can tell, as this portion of the steppes has plantations of forest trees with known records that are over two hundred years old.

Some winter varieties are well known in many parts of central Russia, but we also found choice varieties which have long been here and not distributed in other provinces. For instance here we found 300 trees of a variety bearing the name of an estate, "Bogdanoffa," or in English "God given." It has been in the family for 200 years, and is much prized on account of its extreme hardness of tree, and the size, beauty, quality and keeping capacity of the fruit. It closely resembles our Dominie but has a richer coloring and is much larger. I at once called it a "glorified Dominie." It is now very firm and will keep till May. The tree is as upright in growth as our Gros Pomier, and it has proven as hardy in this trying climate as the Antonooka, which in turn is hardier than the type of apples grown here, resembling in tree and fruit our Duchess.

Another local apple grown here largely, is known as the Kursk Steklanka. It is shaped like a medium sized Alexander. It is also a late keeper and of good quality. Still another *very late* keeper of larger size but only of second quality, is known as "Chugounka" or English "cast iron." A hasty examination would convince the most skeptical that central Russia can produce apples of large size and fine appearance that will keep until the next harvest time with the most common care. We are promised scions of these and other fine apples and pears.

I should add a word about the climate here. Perhaps on account of the porous character of the soil, and the more uncertain time of the first snow fall, trees suffer about as badly here as at a point two hundred miles north, yet the varieties largely planted attain larger size and greater longevity than in the extreme north. This is the section where I expected to meet the best winter apples adapted to our latitude and soil, and my expectations have been more than realized. At this moment we have twelve varieties on our table, which would grace any exhibition table we have had in Iowa, and most of them are of first-class quality.

To illustrate the relative value of the true Russian apples, I will say that a large trial orchard was planted a few years ago on the estate we have to-day visited, mainly with varieties from the most trying portions of Germany. This was done at the suggestion of a German gardener, who urged that it was too conservative to stick to the ancient varieties of their forefathers. In five years *it was a total wreck* and the places filled with the tried and true sorts. The trials with the hardiest pears of south Europe have been equally failures, yet pears are grown of good quality on large trees that have often stood unscathed a temperature of 35 deg. Fah. But the

trees have the special advantage of being worked on the sturdy wild pears of the steppes, the roots of which are as hardy as those of the northern poplars.

I hope to be able to get a few pounds of seed of these primitive pears to start the race in Iowa for use as stocks.

MORE NEW DISCOVERIES—TULA AND ITS FRUITS.

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This is one of the extreme northern points where fruit is grown in considerable quantity. But the soil is not very favorable and it seems to be a point where the thermometer runs lower than in the same latitude further east; or at least the winters are more variable in temperature. As an instance, in the winter of 1867-8, a thaw and rain the last of January, taking off the snow, was followed by what we called a "downpour," sinking the mercury to -46 Fah. But few varieties of the apple or pear could stand this usage, yet many varieties will endure this temperature where not preceded by a general thaw and rain. By general consent the varieties at Tula, Moscow, and other northern interior points, that stand as landmarks amid the quite general wreck, are very popular and form a main part of the many young orchards.

The Antonooka and Red Anis have stood this and every other test, and more trees can be found of these than any other six winter sorts in the trying portions of the north.

While it would be interesting to some to give a full list of the good fruits grown far to the north, it will be best to wait until we are more certain than now of the proper names. To give an instance of what I mean, the Antonooka was a native of Tula or some nearly adjoining province, and has been grown here for at least 200 years. During this long time it has run into several sub-varieties, much alike in fruit and tree, yet bearing local names. So the Anis is an ancient variety of the Volga and has run into varied forms, all valuable, but some better than others. This can be said of a dozen other families of apples. Our object is to sort out thirty or forty varieties suited specially in tree and fruit to our prairie wants in sections where fruit growing is now at a low ebb.

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We have engaged seeds of the best northern trees for trial in Iowa. From this point we work again on a line more like central and northern Iowa than the extreme northern provinces where we

have spent much time and money with a special view to selecting the hardiest known forms of fruits, shrubs and trees.

POSTSCRIPT BY THE SECRETARY.

Here ends the "surplus letters" Prof. Budd speaks of in sending me the materials for these notes and extracts. I have been obliged, for want of space, to cut out much that is interesting and valuable on agriculture and forestry and everything of horticulture except his reports on fruits, and some parts of these; and there is still a mass of information from his further journeyings that I have not seen, but which will come in due time in the transactions of the Iowa State Horticultural Society, of which he is secretary. Membership in that society is one dollar per year for annual and five dollars for life members. Minnesota students in horticulture cannot do better than to join that society as well as ours and secure its reports.

In a report on Russian Fruits made to the Montreal Horticultural Society, Charles Gibb describes many of the foregoing Russian fruits, and gives their names. The Secretary regrets that it was received too late for publication herewith.

*ROSES IN WASHINGTON, AND HINTS ABOUT
ROSE CULTURE.*

Dr. Theodore Mead, an amateur rose fancier at Washington, District of Columbia, contributes the following facts about the queen of flowers at the capital, with some additional matters of interest in rose culture.

Washington is getting to be quite a rose-growing community. Mr. Bancroft, the historian, has about four hundred bushes on his place here, and many more in Newport. His is the best collection in the District. One of our professional rosarians has brought out a new rose during the past year, a cross between La France and an

unknown tea, which is superior to La France itself, being sweeter, a brighter and more lasting color, cup-shaped, and lasts much longer, and is perfectly hardy, growing like an elder bush. It is indeed a glorious rose, blooming from early spring till frost cuts it off, and the most fragrant rose I have ever seen. He calls it the American Beauty. I have the promise of one to send you in the spring, and, if you get it, you may boast of being the only person outside of the District of Columbia who owns one. Besides the American Beauty, I shall send you one of each of the following kinds, all of which are favorites with me :

- T. Adam.
- H. Alfred Colomb, one of the best hybrids ever raised.
- H. T. American Beauty.
- H. Baroness Rothschild, one of the best and perfectly hardy.
- T. Bon Silene. This bush produces the Boston buds, very sweet, fine in the bud.
- T. Bongere.
- T. Catherine Mermet, the finest tea.
- H. Comtesse de Sevenye.
- T. Comtesse de Labarthe, sweet and beautiful.
- T. Comte de Paris, new and very fine.
- T. Cornelia Cook, large white, without fragrance, and sometimes comes with hard, green center.
- T. Devoniensis, very sweet, large and fine.
- H. Eugenie Verdier, without fragrance, *very fine*.
- H. Francois Michelon, late bloomer.
- H. General Jacqueminot, rich, fine, and sweet. The buds of this have sold for one dollar each here in Washington.
- C. T. Glorie de Dijon, climber, very hardy.
- B. Hermosa, free and constant bloomer.
- T. Isabella Sprout, very beautiful buds.
- H. T. La France.
- H. Louis Van Houtte, sweet, large and beautiful.
- H. T. Mme. Alex. Bernois.
- N. Mme. Caroline Kuster, long, large and beautiful.
- T. Mme. Lambord.
- H. Mme. Victor Verdier.
- H. Marguerite de St. Amand.
- H. Marie Baumann, sweet, large, magnificent bloomer. The best H. raised.
- T. Marie Guillot, extra.
- T. Marie Van Houtte, extra.
- H. Marquis de Castielane.
- H. Mons. E. Y. Teas.
- H. Oxonian.
- T. Perle des Jardins, the finest yellow except Marechal Niel.
- C. T. Reine Marie Henriette.
- H. Rev. J. B. Canm.

T. Rubens.

T. Sombreuil, finest late in the fall, after a few light frosts.

T. Souv. d' Elise.

H. Xavier Olibo.

H. Mabel Morrison, considered by many the best white hybrid raised.

Mr. Brady, the originator of the American Beauty, from whom I got the most of my American roses, says you will get considerable bloom from them next summer ; and when of sufficient age and growth to do their best, all of them, except a few of the hybrids, will bloom from spring till autumn frosts. Some of them will be tender, and you will have to remove them to your cellar or a cold frame for the winter. This will be true of nearly all the teas, except Glorie de Dijon. This will grow in Greenland and need no protection, and is a grand rose. The Souviner d' Elise is another very rare and magnificent rose, lasting as cut-flower a long time, and I doubt if you can get it in this country outside the District of Columbia. Several firms advertise it, but I hear another rose is sent in its stead.

I find that the richer the soil, and the more I water my roses, the more bloom I get. It is a great mistake not to water roses. I sprinkled mine thoroughly every evening last summer when it did not rain, and they grew and bloomed splendidly. We had roses every day after they commenced to bloom until heavy frost, about the 4th of December.

Elwanger's work on roses is probably the best on this subject published in America, because it comes down to the present time. His descriptions of roses are sometimes at fault as far as concerns the locality, but as a general thing are very good. Parson's work on the rose is very excellent, but is now out of print. I have Cranston's Rose Culture. It is a very good work, but less adapted to this country than to England, where the Cranston Catalogue and the work on rose culture are the nomenclature, the law and the prophets, on roses in that country.

At the present time there are very few first-class rosarians in America, of whom we may be sure of getting the best plants true to name. A firm doing business in Pennsylvania sends out a fat catalogue reeking with the shallowest self-praise and the most fallacious descriptions of roses and advice to rose-growers. They state that they send out no rose except on its own root, and their catalogue contains the names of roses that will not grow on their own roots. They endeavor to inculcate the idea that they do better on their own roots than when budded or grafted on the Man-

ette or wild briar. This is simple nonsense. Our best hybrids as a general rule do much better worked on the Manette or wild briar, and many of the teas or monthly roses when on the Solfaterre. More especially is this true of all the dwarf growers. It takes a skilled workman to do budding or grafting successfully, but when well done you get a better plant, stronger in growth, and will give more and better bloom. Of course the budded ones must be planted deeper, so as to cover the place of budding, and suckers must be carefully watched for and removed as soon as they appear.

I will send you one of my Helene Pauls also. This is a new white hybrid and pronounced by Mr. Brady to be one of the best. The following I would send you with the other list, but have only one each and they cannot at present be duplicated here. They are all very beautiful and grand roses: Alfred K. Williams, Compté de Flanders, Duke of Feck, Mme. Melaine Willernoz, Mme. Vidot, Mme. Welsch, May Quennell, Mrs. Harry Turner, Mrs. Saxton, Mrs. Jowitt, Paul Ricaut, Star of Waltham."

LAW OF CROSS FERTILIZATION.

We accept most fully the theory that the mother tree or plant controls the form, hardiness and style of the offspring, while the male (or staminate) tree or plant fixes the season and character of the fruit or plant in a large degree.—JAMES T. JOHNSON, *of Warsaw, in the Illinois Horticultural Report, 1881, page 187.*

That is to say, if we fertilize the blossom of the Duchess with the pollen of the Walbridge, and plant the seed of the Duchess, we might expect, (after making due allowance for the different mixtures already in both kinds, from inheritance, but not apparent, perhaps in either tree or fruit, but liable to crop out in the progeny, as we see it in animal life) to find our seedling tree resemble the Duchess in form and hardiness, and its fruit like Duchess in size, shape and color and like Walbridge in quality, late fall growth and long keeping.

The law described above by Mr. Johnson is the same as stated by Mr. Peffer, and repeatedly verified by him in his experiments with seedling apples.

AN ILLINOIS FRUIT HOUSE FOR COLD STORAGE.

The following description of H. C. Smith's fruit house at Toluca, Illinois, is given in the Illinois Report of 1881 by A. C. Hammond and J. S. Johnson, in their report as a committee of observation, page 22:

"It is, in short, a house within a house. Two rows of posts are set in the ground, two feet and a half apart, boarded up inside and out, and the intervening space filled with straw, packed in as closely as possible; two sets of rafters are then put on, the upper set three feet above the lower, which are boarded on the under side, and the space—like that in the wall—closely packed with straw; after which a cheap board roof, with a ventilator on the top, is put on, double doors put in, and the building is ready for use. When we visited it on the 11th of August, with the thermometer standing at 98 degrees in the shade outside, we found the temperature within as cold as an ice house, and the building containing a quantity of apples in as sound a condition as when taken from the trees ten months before.

TOP-GRAFTING—CONGENIALITY OF STOCK AND SCION.

A. G. Tuttle, of Baraboo, Wisconsin, says: "I have been told that the New Russians were largely worked on Transcendents in Minnesota, and that they have injured. I have some notes taken on top-working Tetofski on Transcendent. I examined a row of top-worked Transcendents with Tetofski after more than ten

years' growth. I found in a row of 127 trees one where the Tetofski was alive; 126 were dead after having made a growth of from six to ten feet. I then examined a row of large yellow crab, top-worked with Tetofski, and found two alive in a row of 74, the Tetofski having made about the same growth before being killed as those on Transcendent. I examined also a row of Tetofski grafted on common apple stocks, which had made a growth of from twelve to fifteen feet, and found in a row of 57 every tree alive. So that I think if a tree dies worked either upon the top or root of a crab, it is no sign of tenderness."

Mr. Wilcox, of La Crosse, who has probably had more experience in root and top grafting upon the crab than any other person in this country, reports both the Duchess and Tetofski a failure on this plan, while other sorts of the apple are a perfect success, so grafted, after ten years' trial.

There must be found a congeniality of stock and scion inherent in the race and nature of the two varieties to be united by grafting. Experience will settle this matter by actual trial, but possibly the microscope in its revelations of cell structure may open a shorter road to the knowledge of it.

In the winter of 1882 the writer exhibited at the annual meeting of the Wisconsin Horticultural Society a section cut from a weeping poplar grafted on cottonwood. The stock had died in the first shock of winter, while the graft, some six or eight feet, was still alive and vigorous.

The members present were asked to explain it. Mr. Peffer accounted for it by saying it was owing to the difference in cell structure between the poplar and the cottonwood. The thin sap in the growing season rose through the point of union, but when elaborated and thickened above and attempting to return it was obstructed at the graft and could not pass down to feed the trunk, which had grown weak from lack of food and had died at last of starvation. In the spring when nature called for new growth by the ascension of the sap again in the thin state from the roots, then the graft, receiving no supply from the dead trunk would have died also.

But little has been added at the recent annual meeting, to the society's knowledge of top-working, and the subject seems to be imperfectly understood. That we can grow many good sorts of apples, and perhaps pears, by top-working, that we cannot succeed with any other way, is probably no less true here than in other states. Probably we can grow tenderer sorts here in that

way than in any other; but there is found much uncongeniality between stock and scion, especially in working upon crab stocks, more especially working Russians upon crab stocks, and there is need of more knowledge as to what may be congenial and what not, as a guide to future operations. It is thought that a microscopic examination of cells may refer this whole question to the similarity and dissimilarity of cell structure, and enable us to find out at once, by a comparison of cells of different woods under the microscope, what sorts will be congenial in grafting and what not. If any microscopist having the necessary instruments and facilities will undertake a series of examinations with this end in view, and will furnish the State Horticultural Society with the results in drawings and explanations, I will see that sections of woods most useful in the investigation are furnished. If, upon a preliminary examination, it should be found that the cells of sorts known to be congenial are clearly similar, and if other sorts known to be uncongenial are clearly dissimilar, then the probabilities would be that a series of extended experiments would be very valuable.

NEW L-EA IN TOP-WORKING.

G. A. Knowles presents, and President R. P. Speer indorses, the following plan of top-working: "Put winter apples in center, and early apples on outside limbs. The outer fruit is removed in its season, giving the tree a chance to mature the winter fruit left, and yet to store its wood with the elements for enduring the winter and for extension of growth the next spring."—*Iowa Hort. Report, 1880.*

PROTECTION OF TREES.

E. Gaylord, of Nora Springs, Iowa, writing under date of September 25, 1882, in reference to the cold Christmas of 1879, and

the sudden thaw which followed immediately after, thus remarks upon a kind of protection that does not protect, and another kind that does :

"In all our exposed and unprotected orchards the trees came out in fine condition ; but in our protected sites, hemmed in by hill and timber, they barely had the breath of life left in them. The Duchess grew three inches the season following in the latter orchards, and twelve in the former. The Saxton was not injured on either place. I do not think the cold kills the Saxton. *Shade its body* from the direct rays of the sun, and you can grow it. The sun kills more trees than all other causes."

LETTER FROM MR. PHENIX.

PHENIX NURSERY, DELAVAN, WIS. }
MARCH 8, 1883. }

Oliver Gibbs, Jr., Sec'y Minn. State Hort. Society.

DEAR SIR: Yours, 12th February, informing me that I was elected honorary life member of your society came in my absence. I am very proud of the honor conferred, and shall strive more and more to serve you and the good cause of horticulture, which, everywhere I go, seems to me suffering from popular indifference. For two months this winter I was pretty far south, where I saw in a strictly railroad section hundreds of dollars spent for strong drink and tobacco, but not one cent for fruit, though easily obtainable. In view of such facts, prevailing measurably all over this broad land, I am constrained to wonder that any horticulturist, true to his colors, can help hating and fighting with all his might these curses that rob to the very bone, homes and families, men, women and children, of earth's blessed fruits and flowers and books and papers and pictures and music. Strong drink and tobacco are the great barriers to the growth and prosperity of American horticulture. With warmest acknowledgements and best wishes, most truly,

F. K. PHENIX.

PROTECTING THE STEMS OF FRUIT TREES.

Is there any effective method of protecting the stems of apple and cherry trees from sun-scald, causing decay of the bodies and consequent death of the trees?

W. T. Nelson, of Wilmington, in the Illinois report of 1881, recommends setting young trees leaning to the southwest, and protecting trees in orchard by setting up fence boards or siding so as to keep off the two o'clock sun.

Tyler McWhorter, of Aledo, Ill., in same report: "What is generally called sun-scald is the effect of the sun shining upon the frozen tree after an intensely cold night. Where the rays strike the body of the tree the sap or moisture is melted, while all around is frozen; this occurs usually at about two o'clock in the afternoon, when the sun's rays produce the greatest effect."

Geo. P. Peffer, in same report: "I agree with Mr. McWhorter. The sun shining upon the body of the tree in day time thaws the sap, and then freezing at night continually evaporates the moisture in that part, and death to such part must ensue; but if protected from the rays of the sun during the day, this sun-scald will be prevented. I have shaded my trees with pickets and with stiff paper."

The Secretary. In conversation with a fruit-grower of Jefferson County, N. Y., last fall, I was informed that it was the general custom in that region of commercial orchards to protect their young apple trees from sun-scald. The method there is "boxing," as they call it; that is, two pieces of fencing nailed together and fastened to two stakes.

LETTER FROM HON. MARSHALL P. WILDER.

Boston, Dec, 7, 1882.

MY DEAR SIR: I thank you most sincerely for the excellent and useful report of the Minnesota Horticultural Society. It is

very interesting and valuable, not only to your own state, but to fruit and other cultivators in different localities. The individual reports show that their authors know of what they write. Your method of procedure, first to introduce the subject, then discuss it and bring out the experience of cultivators, is a good one. I notice you still keep the designation of Rogers' grapes by numbers. This has already led to confusion, and should be abandoned unless the name is also used. For instance, the Wilder (No. 4) is also known as No. 9, which is an error. No. 9 is Lindley, and so on with others. I suppose "the horticulturist" alluded to in the strawberry discussion may be myself, as many years since I remarked that there were three absolute prerequisites for success with the strawberry—first, plenty of water; second, a little more water; third, more water still.

I shall soon fix the time for the next meeting of the American Pomological Society in Philadelphia, and trust your society will be fully represented by men and fruits.

Yours respectfully,

MARSHALL P. WILDER.

Mr. GIBBS, Secretary, etc.

LETTERS FROM PROF. BUDD.

IOWA AGRICULTURAL SOCIETY, }
AMES, IOWA, Dec. 8, 1882. }

Oliver Gibbs, Jr.

MY DEAR SIR: Your kind letter is at hand. With you Antonooka would succeed I am sure. This is the best winter apple I know of that will be sure to live as far north as you are, and most likely Minneapolis. I have not known it to kill even at Tula, with 45 degrees below zero without snow. The apples of Kazan grow larger farther south, but in all cases they are slow-growing varieties, yet they bear when very small. The Anis Alui, for instance, is a North Pole apple. It should grow in Manitoba, or up on Leaf River, but with you I am quite certain it might blight. The grade of Antonooka that will grow at Say Tula (300 miles

south of Moscow) will be surest to do well in your section. But several grades of the steppe apples should be tried. I speak of grades and families, as at Riga, St. Petersburg or anywhere within 300 miles of the coast, they know nothing of the dry interior where winter snows are very uncertain. The pears of the interior are as hardy as the poplars. You ask how the dwarf trees of the Volga grow here. Slowly, and make scrubby, unsalable trees in nursery. Too far south for them. But many of the apples farther south grow as well, or better, than Duchess. I was two months in Russia, and two months in Poland, Hungary, Silesia, Bohemia and Transylvania.

J. L. BUDD.

AMES, Jan. 1, 1883.

MY DEAR SIR: Yours at hand. The Anis is the name of a family of apples grown on the upper Volga in immense quantity. They are as hardy, for aught I know, as the Russian Poplars. The Aport is another family grown lower down the Volga, in the ancestral home of the Duchess. The Alexander is of the Aport type, but is not a true blue north Russian, but an apple found nearer the Caspian. Mr. Tuttle has many of the coast apples but very few of the interior ones. I know his list. But some of his are valuable. Red Queen, Borsdorf, Charlamoff, Yellow Transparent, Belle de Boskoop, etc., will not be apt to fully meet your wants. The upper Volga sorts will. If he has the Antonooka it will stand with you, and prove a God-send.

I enclose a sheet of paper I threw aside, giving my notions of the Antonooka. Yours,

J. L. BUDD.

Antonooka: This variety is well known in the valley of the Moselle France, and is popular in the most trying positions east of the Swabian Alps and north of the Carpathian range, where it is mainly grown as *Passarts Nalivia*. In the large orchards of Poland, and over the great plains of Russia, it is one of the best known and most profitable of the winter sorts. As to hardiness, the finest old trees of Central Russia, withstanding the test winters of the past fifty years, are of this variety. Beyond doubt it will grow and bear good crops in the most exposed prairie of the State, at least, if it fails, we may give up all hopes of finding a winter apple as hardy as the Oldenburg. The fruit is large, yellow oblong, and medium-sized specimens are so nearly like our best specimens of Grimes Golden as to deceive the ordinary handler of fruits. In texture it is some coarser than Grimes, but in acidity and flavor it is much the same,

In Northern Iowa it will keep until spring if picked early. In Central and Southern Iowa it will keep as well as Grimes, but may require earlier picking. As the trees have a tendency to early maturity, the fruit of all Russian winter apples must be picked earlier than we pick even the Jonathan. But if we picked when quite tender, for eating, the Antonooka will keep for months if properly stored.

The scions can be obtained in any quantity of C. H. Wagner, Riga, Russia.

AMES, Jan. 11, 1883.

MY DEAR SIR: (1). Russia is very great country. In the south it approaches our Florida; in the north it reaches the polar ocean. The coast on the west, for 300 miles in, is swampy or sandy land, more or less timbered. From Riga to St. Petersburg, in the coast region, are grown *only summer apples*, and the varieties grown here are utterly unknown 1,000, or even 500, miles east. The coast region has cool, short summers, while the far interior grows corn, melons, and tomatoes. At Simbirsk, on the Volga, the summer mean is that of Iowa City, while its winter mean is that of Northern Minnesota, with far less snow. Here are found the Minnesota apples and fruits. Even the varieties from this point *may blight* under some circumstances, as does the Duchess. But the coast varieties will blight *much worse*, as, like the Siberians, they are indigenous to relatively cool, moist climate.

(2). The Siberian crab is hardly known in Russia. We saw *Pirus Baccata* and *Pirus Prunifolia* of large size at Warsaw, St. Petersburg, and Moscow, but only in the Botanical gardens. At Kazan, Simbirsk, Volsk, etc., on the Upper Volga, we saw a few young trees in the gardens of proprietors. It was always pointed out to us as a new thing, for ornament only, under the name of "Chinese Apple." We saw only one variety in a two months' ramble in the interior, and that was just like what we call the "Brush Crab." The only blight I saw in Russia was on some young crabs in a yard at Veronesh.

(3). We saw no true crab in peasant orchards. In some places they grow quite largely—small-sized apples, like the Anis, Blackwood, and Good Peasant, but they are real apples with leaves not like the Duchess—but resembling the wild apples found in the timber along the streams all over Central Russia. Their wild apple makes a tall forest tree on the black soils, as does their wild

pear. On the thinner soils farther north all forest trees are inclined to be small and scrubby, and the orchard trees make not much of a show of trunk or top when thirty years old. If Mr. Phoenix has said these hardiest of the Russian trees have a trace of Siberian crab in them he has been misinformed. Chas. Gibb, the well-known horticulturist of Abbotsford, Canada, was with me, and often expressed surprise that the Siberian crab was so little known in any part of Russia, and that no kind of crab was common. Often the wild apple trees are found of large size, and with nicely-rounded tops, in the fields, but their wood and leaves more nearly resemble our wild apple than the Siberian. The fruit is about the size of our wild crabs, red or yellow, hard and austere for eating, but when cooked they have none of the astringency of the *Pirus Coronaria*.

(4). I do not believe we will ever have an apple tree wholly free from blight when mingled with the crabs. In Iowa I am not alone in the belief that the whole crab tribe should be rooted out. The Duchess is a Simbirsk apple. We can get from there fifty sorts as free from blight, but none more so. J. L. BUDD.

LETTER FROM MR. PEFFER.

PEWAUKEE FRUIT FARM AND NURSEY,

PEWAUKEE, Wis., March 13, 1883.

Oliver Gibbs, Jr., Secretary Minnesota State Horticultural Society.

MY DEAR FRIEND: * * * I have returned from our southern trip, where we attended the Mississippi Valley Horticultural Society convention, at New Orleans, two weeks ago, and observed that parts of the States of Tennessee and Mississippi are no more successful in raising apples than Wisconsin and Minnesota. I saw large orchards, trees ten to twelve years old, all dead; and conversing with one of the delegates about it, he said that the trees grow well when young, but as soon as they get to bearing they die. I asked the reason, but he could not give me any, but said that they got a few native seedlings that have proved productive and are yet healthy, and are over forty years old, and he proposes to propagate from them. I advised him to use the seeds from

them, and in a few years they will see them hardy enough, especially if they plant the seed where the tree is to stand in the orchard. As near as I can find out, the trees overbear, and having generally dry falls they loose their leaves early, and by the droughts and shallow planting, or planting on any incline, the surface soils are all washed away, and the roots being near the surface and exposed, the hot sun and winds dry them up. They appear to be root killed. I think that paper [his essay on Seedlings] would be to some advantage to their society. I am sure the principle is correct, as it is following nature. Those old trees that the French missionaries planted on the shores of the upper lakes in Michigan and Wisconsin, a few hundred years ago (pear and apples), are witness, as they are good yet for an other hundred years if they are let alone.

We have had a long, hard winter, and I find that some varieties of the apple and pears are injured badly. Even the Flemish Beauty is badly hurt, but I find five of my seedling pears good to the tips, and blossom yet good, while seven are hurt in the tips, and blossoms also; and all the grafted sorts are black, and young trees killed, except winter Nellis. With apples, Westfield Seeknofurther are nearly ruined, and Fameuse shows badly colored wood, and many others.

I made drawings, or outlines, and descriptions from the seedlings left me from your winter exhibition, but I think there was a mistake in the award on the sweet apple, as it proved when I cut it and got the flavor, etc., that it was the Utter, grown on a crab stock, and was not a sweet apple at all. The label might have been changed while we packed up.

Cordially yours, etc.,

GEO. P. PEFFER.

THE STRAWBERRY LEAF ROLLER.

LETTER FROM PROF. FORBES.

OFFICE OF STATE ENTOMOLOGIST, }
NORMAL, ILLINOIS, March. 22, 1883. }

Mr. Oliver Gibbs, Jr.

DEAR SIR: The strawberry leaf roller (*anchylopera fragariæ*) is said by fruit-growers here to be a nocturnal moth, and I don't

doubt the correctness of their statements, although I have not studied it especially myself, and cannot say from personal observation. The larva is said to pupate within the fold of the leaf, and to spend its whole life as pupa in that position. How long it remains exposed on the surface, before folding the leaf together, I am not able to tell you at present. It was so nearly exterminated by the method of burning in this vicinity before I became responsible for work in economic entomology in this State, that I have had no opportunity to observe it. By the way, have you learned the particulars of the method to which I refer? If not, you should certainly do so, as it seems to be a specific for the pest. The practice here is to mow the beds as soon as the fruit is gathered, and burn them over when dry and when the wind is blowing briskly, so that they will burn quickly. As the leaf rollers are upon the leaves at that time, this method checks them so thoroughly that they do little damage the following year, and, if the practice is followed persistently, it soon reduces them to insignificance.

Very truly yours,

S. A. FORBES.

P. S.—It is the universal testimony here that the plants are not injured in the least.

DEATH OF HON. LEONARD B. HODGES.

Since the annual meeting of the Horticultural Society, the author of the address on Forestry, delivered on the last day of the session, has laid down life's weary burden and gone to his rest. It is not ours to write his eulogy, nor is this the time or place for it, but it seems improper to let the report come from the press without at least a mention of his death, and the following is selected from the newspaper press, expressive of the respect which every horticulturist will feel for his memory.

"Every one who has enjoyed the acquaintance of Hon. Leonard B. Hodges, will deeply regret his death, which occurred at his residence in St. Paul, on Saturday evening, April 14th, 1883. He was a public benefactor. Seldom has it been the province of a

single individual to have accomplished so much real, lasting benefit to the present and future generation of the Northwest as Mr. Hodges. He was the John A. Warder of this portion of the Union. He was the most practical arboriculturist in the country, and the loss sustained by his death cannot be readily filled. He was a native of Ontario county, N. Y. His father was a surgeon in the United States army, and his mother, Sarah Dunham Bacon, was a sister of the celebrated divine, Rev. Dr. Leonard Bacon. Mr. Hodges came to Minnesota in 1852, and has been honored with a seat in the State Senate, and occupied other high trusts of a public character with great credit. The *Pioneer Press* truly remarks that he has proved that trees can be made to grow, if properly planted, where nature has failed to provide them, and that their effects upon health and climate is a matter worthy of close and careful consideration. Mr. Hodges' contributions to the literature of arboriculture were of great value, and speeches upon the subject were practical and convincing. He was a terse writer and a vigorous speaker. His "Manual Upon Tree Planting" is one of the best works upon the subject that has ever been written. His death was caused from a complication of diseases, having their origin in an enfeebled condition of the digestive organs. He was sixty years of age. A great and good man has gone to rest."—*Col. John H. Stevens, in the Farmers' Union.*

THE WEALTHY APPLE

P. Barry, of Rochester, N. Y., the veteran pomologist, secretary of the native fruit committee of the American Pomological Society, in a report of new and rare fruits for 1882, speaks of the Wealthy apple as follows:

"The report on apples is necessarily very brief. Unfavorable weather at the blossoming season proved disastrous to the apple crop in this vicinity, and we were unable to see or test the newer kinds. In December we had the pleasure of examining some fine specimens of the Wealthy apple, which Mr. Peter M. Gideon, the

originator, brought with him from his home in Minneapolis. The fruit resembles the Jonathan in several respects, the flesh being white, fine grained, and flavor very good. It is certainly an iron-clad, in which we can all with great reason take much pride. The acquisition of such a valuable apple as this causes queries like these: Are we, as fruit growers, doing our utmost to advance the interest of pomology? Amid the cares and anxieties of our daily avocations, are we not forgetting the vast field for improvement which lies before us? A chance seed placed in the ground may yield a product the value of which it is impossible to foretell. Now, if we utilize the knowledge and skill in our possession, and by artificial fertilization produce a seed that the results of which can be anticipated with considerable accuracy, what a treasure have we not gained? Not alone is abundant pecuniary reward in store for us, but a never-failing pleasure, such as will result from the study of innumerable forms and varieties which can be obtained from judicious cross-fertilization. We are trying hard in various ways to progress. Let us not overlook this art, but make intelligent use of the means at our command. Then our progress will be rapid and commensurate with the times in which we live.

STREET PLANTING OF TREES.

The following extracts are taken from Hon. C. M. Loring's address delivered before the Oak Lake Park Association, of Minneapolis, as published in the *Farmers' Union*:

TREE PLANTING IN WASHINGTON.

I understand your association contemplates taking the management of the tree planting in your addition, and as I have recently given some attention to the work of a commission whose duty it is to plant and care for the trees in the parks and on the streets of the City of Washington, I have, upon the invitation of your secretary, consented to tell you as briefly as possible something of what

I learned from the superintendent of the Parking Commission of that city, Mr. W. R. Smith, who is also superintendent of the Botanical Gardens, and I hope the recital may be profitable, and not uninteresting to you.

Mr. Smith has had the personal supervision of the planting of over 60,000 trees, on 125 miles of streets in Washington, divided as follows:

	<i>Trees.</i>
50 miles of maples (in variety).....	25,000
14 miles of poplars.....	6,500
12 miles of box elders.....	5,500
11 miles of elms.....	5,500
11 miles of lindens.....	6,000
10 miles of buttonwood.....	4,500
18 miles of miscellaneous.....	8,000

In planting trees the commission have adopted the plan of "poling;" that is, cutting every branch off, leaving a straight pole. The trees are of uniform height, and the heads form more symmetrically than when planted with a few straggling limbs, and I know from experience they are more liable to live. Great care is taken in planting; large holes are dug from which two or three cart loads of earth are removed, and its place supplied with good rich soil. No stimulants are ever employed. The trees are taken from the nursery, or forest, as the case may be, the roots carefully and smoothly cut, and while being transported to the place where they are to be planted, are kept sheltered from the wind and sun. After being set in place, and the earth firmly "puddled" about the roots, boxes made of twelve two-inch slats, are placed around them. These boxes serve two purposes; they protect the bark from the sun, and from the horses of the doctor, the milkman and grocer. These, my Scotch friend said, were the mortal enemies of city trees. It costs to plant trees in Washington in the thorough and careful manner described, about \$2.50 each, and the percentage of loss is so small, that the fact is demonstrated that it pays to entrust the planting to experienced hands. The loss on over 60,000 trees has been less than 1 per cent.

TREES IN MINNEAPOLIS.

The people of Minneapolis have lost more trees by failure to protect and care for them, than are growing here to-day. This may seem to you a rash statement, but as I look back twenty years

and think of the number destroyed by horses, and killed or injured by the rays of the sun, and through neglect, I am convinced it is true. The police of Washington are required to watch the trees, and report when any are injured, or the boxes broken.

THE BEST VARIETY OF TREES TO PLANT.

The white elm is the tree of all others for our streets, and yet I would recommend that a few streets be planted with the soft maple, the linden and the box-elder. It is a mistaken idea that the elm is a slow grower; I admit that it is for the first two years after re-planting, but at the end of ten years it will have obtained a growth as large as any tree we can plant, except the poplars. The maple, if properly protected from the rays of the sun, and kept well headed in the first two years, will make as good a shade tree as can be planted. It will withstand the force of the winds as well as the elm, as I can convince anyone who will take a ride with me through the city.

The box-elder is rather a coarse tree, but it can be trained into such symmetry, and it puts forth its leaves so early, that it is a favorite with some. The linden is a beautiful, clean tree, but does not do well in our sandy soil, will give great pleasure and satisfaction.

My experience and what I have learned from others who have had life-long experience in tree planting, leads me to say to-you: Do not plant trees over three inches in diameter. Do not try to grow tops until you have roots to sustain them. Do not plant a tree in a small hole dug in the sand and expect it to grow. Do not plant a tree unless you place a hitching post near it, as the most careless man will drive a few feet past his destination, if he sees a post to hitch to, rather than hitch to a tree. Do not plant trees too near together; place them at least thirty feet apart; forty is better. Do not plant two varieties on one street. Lastly, when you do plant a tree, give it as much attention as you would a hill of corn it will be almost sure to live.

TEMPERATURE OF TREES.

In a bright winter day two thermometers suspended on opposite sides of the same tree, one in sunshine, the other in the shade, will indicate a difference of more than one hundred degrees—a most trying ordeal for organized vegetable tissues.

JOHN A. WARDER.

TRIMMING FRUIT TREES.

Just about this time people are very apt to think that their apple trees need trimming and they go at the work in such good earnest, that in a couple of years at the latest they are looking about for new trees to fill vacant spaces. We have had considerable experience in this matter of pruning and have learned that more trees are killed by the knife and saw than by every thing else except utter neglect to take any care of them. In this climate at least, apple trees should never be trimmed at all except in mid-summer say from June 1st to July 15th and no main limbs should ever be taken off, but only such as come from the larger ones inside the top and such as cross and gall each other. If the trees are young and vigorous the places where small limbs are cut off, if it is done at the right time, will entirely heal over; but the best plan is to so train trees from the start that they will never need any pruning more severe than can be done with the pen blade of an ordinary pocket knife. If there are trees in the orchard or garden that absolutely need pruning don't touch them yet but wait till June and then cut carefully and gingerly.—*JOHN N. MURDOCK in Wabasha Herald, May 9, 1883.*

FRUIT PROSPECTS IN SPRING OF '83.

In view of the public interest this spring to know the effect of the hard winter upon fruit trees, plants, vines, etc., in various parts of the Northwest, circulars of inquiry were sent out requesting reports. All the letters received, or abstracts of the same, are given

below. They speak for themselves without comment; but a curious feature is, that Iowa and Wisconsin are shown to have suffered more than Minnesota, and the latter worse in the southern part than anywhere else. President Harris' letter, from La Crescent, which is given in full, being the most discouraging of all:

LETTER FROM PRESIDENT J. S. HARRIS.

LA CRESCENT, MINN., April. 16, 1888.

The limited time given for an answer to your circular of April 1st, does not allow me time to give it as thorough attention as it deserves. I am making some observations almost daily, and feel pretty safe in saying that the general condition of fruit trees in this section is not worse than in the spring of 1881, and that I did not consider it discouraging to our hope of final success with the apple. The Duchess of Oldenburgh is probably entirely free from injury, under all circumstances, as are also nearly all of the Siberian scions. The Maiden's Blush, Minnesota, and one sweet variety are a little discolored. Farther examination shows the Wealthy more injured than I stated in my letter to the Farmers' Union last week. The injury will make trees shorter lived, as it is at the point where the branches leave the trunk, but will not make the tree less valuable for fruit until after decay sets in. All the varieties recommended by our Society bid fair for a crop of fruit this season. Plumb's Gider can hardly recover from its injuries. Several of the seedlings show no injury whatever. Native plums are all right. Flemish Beauty pears badly blackened. Fruit buds on cherries mostly killed. Strawberries, whether covered or not, look promising. The Gregg, Black Cap, and most of the red raspberries are killed down to the snow line, and some of the blackberries are considerably injured. Grapes, where they have received any protection, except the Prentiss, are perfectly sound. When unprotected all varieties, except Concord, Moore's, Early, Janesville and Worden, are injured above the snow line.

I find that on northern slopes and high elevations the injuries show less than in low valleys and warm southern exposures. I have not given much attention to ornamental trees and shrubbery, but the great number of Norway spruce, that show red foliage, cannot help but be noticed. Have seen no other evergreens that appear to be injured.

FROM E. WILCOX.

LA CROSSE, April 15, 1883.

Your circular asking for report of condition of fruit trees, plants, etc., received to-day. In our orchard at this place nearly all kinds are uninjured. This is true also in the nursery of Duchess, Tetofski, and the crabs, except a few of the Whitney where the bark burst at the ground. The Wealthy, Utter, Hass, and Walbridge but slightly injured. Rhodes Seedling all right. Atwood Seedling is badly hurt. We have another seedling I am pleased with. More about this one at another time. Strawberry plants are looking fine. Raspberries killed back some. Prospects for apples, with me, I consider good. I am a little chary about giving opinions thus early, knowing from bitter experience how easy it is to be mistaken, and perhaps my present opinion will need to be changed later in the season.

FROM G. P. PFEFFER.

PEWAUKEE, WIS., April 12, 1883.

Yes, there are funerals all around here in fruit trees. This winter used up most all the pear trees, Flemish Beauty not excepted. Winter Nellis seems all right yet, and so are a few of my best seedlings; three as good in bud and wood as crabs. About the Russian apples I have only got about fourteen sorts. A few of them the new wood colored some, same as Fameuse, Haas, Plumb's Cider, Pewaukee, and Walbridge, but most of them all right. All my cherry trees, E. Richmond, Kentish, Eng. Morrillo, E. May, and Common Pie, wood all good, but blossoms killed. Plums, Desoto, Miner, Weaver, and Early August, blossoms good; but Imperial Gage, Lombard, Duane Purple, N. Orleans, Yellow and Purple Egg, are hurt on the tips of new wood, and blossoms killed. On pear blossoms we can not tell yet, but the Birkett (that Illinois seedling) seem all right in wood and blossoms. I find wood all sound on only seven varieties, and five out of them are seedlings of the Northwest. We had again started with forty-two varieties; nine all dead, ten nearly so, and balance are recoverable? Weather fine; frost nearly all out. Shall commence digging to-morrow.

FROM PROF. J. L. BUDD.

AMES, IOWA, April 18, 1883.

* * Central Iowa has been scorched this winter. The bulk of orchards were of Ben Davis, Grimes' Golden, Jonathan, Domine, and like sorts as to hardiness, and are in bad shape. Wolf River, Duchess, Plumb's Cider, Wallbridge, etc., all right. Gros Pomier is badly injured. Every true Russian is perfect, even the one-year old.

FROM COLLINS PRATT.

MILLVILLE, WABASHA Co., MINN., April 21, 1882.

Yours of April 14 received. My Duchess and Tetofski never came out any better. Wealthy and Wallbridge wintered not so good. Limb on southwest side of tree, and southwest part of the limb, for a few inches from the trunk, black between bark and wood; the balance of the limb good, and also the trunk. My Hass, Malinda, Pewaukee, Fameuse, Saxton, and Red Astrachan affected, as Wealthy and Wallbridge, only more so. But am surprised that they have come out as well as they have, hearing what I have from trees in Iowa and other places.

FROM O. F. BRAND, FARIBAULT, APRIL 16, 1883.—I can truly say that there has been but little injury to my orchard trees or nursery stock. Blossom buds on Wealthy, Duchess, Tetofsky. Miller's seedlings from Duchess, several Russian varieties, Plumb's Cider, and Price's Sweet appear to be all right. Strawberries and raspberries never came out better. Evergreens look good on my grounds, but on light soils here are a little colored.

FROM VICE PRESIDENT A. W. SIAS, COLLEGE HILL NURSERY, ROCHESTER, MINN., APRIL 16, 1883.—Yours of the 14th just received. In reply will say that my Hybrids have all come through in good order. Also Wealthy, Duchess, Rollin's Pippin, Elgin Beauty, Wabasha, Rollin's Prolific, Spice Sour and all the Russian varieties. The Cherries, and Flemish Beauty Pear but slightly injured. Raspberries all right.

FROM A. G. TUTTLE, BARABOO, WIS., APRIL 6, 1883.—The past severe winter has confirmed my opinion of the extreme hardiness

of the new Russian apples. They are, without an exception, bright and green to the terminal bud, none less so than the Duchess. I have cut scions of them, within a few days, as bright as they were in the fall, while all the non-Russians, except the Wealthy, are more or less discolored. I cannot say too much in praise of the Transparent as an early apple. The Green Streaked is as large and handsomer than the Alexander, and of better quality. Zolotoff is an early and abundant bearer of fruit, larger than the Duchess, a good eating apple.

They are being sold by traveling tree men, but so far as I can learn are bogus. I have had several lists sent me; none of them had any true Russians. In Maine, Northern Vermont, and Canada they sell Walbridge and Pewaukee for Russians; in the west, Polo, Magog, Emperor (which is Alexander), and a few other names not found in the Russian list.

There is real value in the new Russians, not only to the planter, but also to the propagator, as I find always no killing back in the nursery, as I have of common varieties, after a hard winter.

FROM C. F. MILLER, DUNDAS, APRIL 17, 1883.—As far as I have examined in my orchard I find *everything* O. K. We are on high, rolling, timbered land, where my orchard is protected on the south, west and north by belts of the native forests, and hundreds of evergreens at the side and among the them. Even my Haas is *all right*. My Turner Raspberries which were planted directly on the north side of an evergreen screen are leafing, or breaking out of the bud, but a row that is about fifteen feet from it directly on the south side of the evergreens is dead. My Austrian and Scotch pines, which are from fifteen to twenty feet high, have become injured on the south side, so also is the Norway spruce, but my balsams and White pines, as well as my White and Blue spruce are not phased. My Hydrangea Grandiflora Panniculata is as green as a leek.

FROM UNDERWOOD & EMERY, LAKE CITY, MINN.—After a careful examination of our stock and orchards, we are happy to state that the comparative damage to stock is very slight. Having confined ourselves strictly to the iron clads, both in graft setting and orchard planting, we find they have staid by us in spite of the fact that the past winter has made total wreck of entire orchards 300 miles south of us. Wealthy, Duchess, Beecher Sweet, Orange, Minnesota, Early Strawberry, Whitney No. 20, cut bright and fresh,

and are now in orchard loaded with fruit buds. Small fruits are also giving unusual promise, having come through in fine shape.

FROM JACOB AUSTIN, FERGUS FALLS, APRIL 17, 1883.—Wealthy and Duchess badly frozen; Snyder blackberry more or less killed; Gregg raspberry badly damaged.

FROM WM. McHENRY, ST. CHARLES, MINN., April 16, 1883.—I find the following varieties of apples all right and promise fruit this season on our ground: Rollin's Pippin, Wealthy, Rollin's Russett, Wabashaw, and Elgin Beauty; while the Haas, Ben Davis, Cooper, Alexander and many others are played out. Raspberries, Brandy-wine, Turner, Mammoth Cluster and Doolittle all O. K.; strawberries all looking fine.

FROM TRUMAN M. SMITH, ST. PAUL, 4, 18, '83.—So far as I can see, all plants, shrubs and trees have wintered well. I have cactus that have stood out doors entirely unprotected this winter. Currants, strawberries and shrubbery, all seem right now. Grapes and roses not yet uncovered; cannot tell, but I expect to find them all right.

FROM SETH H. KENNEY, MORRISTOWN, RICE Co., April 18, '83.—Fruit trees looking splendidly. Wealthy, Duchess, Whitney No. 20 and Transcendent, full of fruit buds. The Transcendents that have been heavily mulched with bagasse do not blight, and have not, with this treatment. Strawberries and raspberries have come through in good condition. I have one seedling apple from the Duchess, but later in season, October and November, and smaller, but very fine; bore some last year; tree very hardy; grows some like a crab tree, with spines; promises a good crop this year.

FROM E. B. JORDAN, ROCHESTER, MINN., April 17, 1883.—I have been top grafting for the past week, and find hardy apple trees, such as Duchess, Wealthy and Tetofsky in good condition, but many tender sorts have suffered badly. The Mann apple is badly killed. My prospect for a large fruit crop was never so good as at present. As I am engaged quite extensively in the orange and nursery business in Florida, I expect to be able to put in a full year, as I return there about the 1st of November to spend the six months the nursery here is closed up in the embraces of frost and ice.

FROM K. H. WHIPPLE, NORTHOME, MINN., April 21, 1883.—The tender varieties of apples are hurt, but the hardier kinds are all right, such as Duchess and Wealthy and the crabs generally. Strawberries went through without any protection all right; I never saw them look better this time of the year, also raspberries are in nice condition. We have had as favorable a winter for plants as as ever I knew, on account of the snow coming early and laying on all winter and going off so late. I have a few round turnips that I did not pull, they are now growing and look as fresh as though we had not had any winter. I have dug four feet into the ground and found it thoroughly wet that depth, so that trees and plants will not want for moisture for a long time.

FROM A. J. PHILLIPS, WEST SALEM, WIS., April 8.—I have as yet made but little examination. Have found so far Duchess, Tetofski, McMann's White and Wolf River unharmed. Some Wealthies burned a little on tips, but mostly unharmed. My two seedlings all right; peach apple perfect. Fameuse, Utter, Tallman, Red Astrachan and some others quite brown on tips. Whitney No. 20 fresh as a lilac.

FROM WILLIAM FORSTER, CHATFIELD, APRIL 23, 1883.—My Sweet Seedling perfectly hardy, the severe weather having no injurious effect. A few of the tips of last year's growth on the Red Seedling seem to be somewhat injured, but do not think the tree otherwise injured. My other seedlings seem all right so far as examined. Regarding other trees, I will say that the St. Lawrence Fameuse and Red Astrachan are injured, but cannot say to what extent, though I think not seriously. White Astrachan uninjured, and think the Haas all right. I cannot say anything regarding the fruit trees of any other orchard, as I have had no chance to examine them. My seedlings are good keepers, as some of them are very sound yet, so I think we may safely say that they keep well until April.

FROM W. GOLDEN, PLAINVIEW, May 5th, 1883.—So far as I know the past hard winter has done no damage to apples or crabs in this vicinity, and I think the prospect now is good for a crop. Strawberries wintered splendidly and look well at this time. Raspberries—red, yellow and black—are in fine condition. Blackberries killed down to snow line. None here but mine. I have the Lawton, Taylor and Wallace. The Lawton that I buried look fine,

but my Taylor never killed before. Cherries are not hurt. Pears, not protected, are badly hurt; those that I protected are uninjured. Peaches not protected, dead as a smelt; those I protected promise a crop. Quinces unprotected killed to snow line; the protected ones come out well.

As to new fruits, Mr. Jacob Hesig has an apple tree twelve years old from seed planted by his wife that never has killed a twig; it is a good keeper, in fact a long keeper; medium size and fine sub-acid flavor. Mr. Hill has another seedling twenty-six years old, that never has killed a twig nor blighted; small size fruit, quality fair, keeps well to January. Seed planted by himself.

But few near me pay any attention to small fruits except strawberries, and that leaves my report brief and bare.

Apples here, the hardier varieties, are raised very generally.

Grapes look well, but few are raised here.

FROM D. K. MICHENOR, ETNA, FILLMORE CO., MAY 1.—All hardy varieties came through the winter all right. Of the half hardies the Ben Davis suffered most; it is killed outright; Hass, Fameuse, etc., slightly injured. Small fruits not grown to any extent, but what there is give promise of a fine crop of fruit. The prospect for an apple crop is good, except that on the tender sorts I think the blossom buds are injured somewhat. I have confidence enough left to plant out 400 Wealthies this spring.

APPENDIX.

FRUIT CULTURE AND FAST HORSES.

The Civilizing Effects of the Former and the Demoralization Caused By the Latter—An Address Delivered Before the Minnesota State Horticultural Society at the Annual Meeting January, 1879.

BY PETER M. GIDEON, OF EXCELSIOR, MINN.

[Omitted from the Report of 1879, and now printed by order of the Society.]

Mr. President and Fellow Citizens:

I presume that we all feel that we came here to promote State and national greatness, by encouraging the growth of fruit.

The culture and use of fruit we hold to be the greatest of all civilizing elements known to man, and the more and better, the greater the advancement of moral refinement; and to that end we are here to ascertain the best in quality that are adapted to our climate. And not only to ascertain the best now extant, but to encourage the production of more and better, as well as the best mode of culture.

The history of all nations shows that national greatness keeps pace with the luxuries of life, and that the most attractive, longed for and sought after luxury is fruit. And in proof of the moralizing influence of fruit is the fact that fruit growers seldom use tobacco, beer or whisky, and that their children seldom become thieves. And that for the reason above stated, that of all luxuries fruit is the most tempting, and those that have not got a supply, look wistfully at that of others, and the parent so desiring, the thought takes form in the forthcoming child, so that with it to see, is to contrive and steal.

A natural result of the law of reproduction, that the child should start where the parent stopped, and sink or soar to where the parent longed to go. The great majority of thieves take their first degree by stealing fruit, and until we can induce a general culture of fruit, so that every family can luxuriate under his own vine and fruit trees, we will be

plagued with thieves. If ever the time shall come that swords shall be beat into plowshares, and spears into pruning hooks, the desert blooming as the rose, with none to molest or make afraid, it will be when each family own a home, grow and eat all the luxuries the land can be made to produce. For then, and not until then, will all incentives to vice be cut off.

Monopoly will then have run her race in making kings and paupers, and the anomaly of to-day, of big rogues punishing those of smaller fry, be heard of no more—save as follies of the past.

But it is for us to say what shall be in the long distant future, whether the desert shall bloom, and none to molest or make afraid. for we have reached a turning point in the nation's destiny, and it is for us to say, shall we go up or shall we go down. And just here let me entreat you, to ponder well the drift of morals that rule the nation, and having so pondered, sound the alarm, name the evils, brand them as God did Cain, and slay them at next election, if, indeed, the sword is not called out sooner.

And to practice what I preach, just here I will take a survey of some of the most noted evils that clog progress and foster vice. And first to note is the fostering of the fast horse, the most enchanting lure and the surest to lead to individual and national ruin known in the history of man. And yet, with all the lessons of ages, with naught but ruin in the tread of the fast horse, at our fairs he is made paramount to all else—all other interests called in to do him homage. Princely awards are offered to induce him in, and at the closing up are paid, a mere pittance to all else, and that pittance often not paid.

That the fast horse calls in the rabble I admit, but he gets more than his share of plunder. Plunder I call it, for plunder it is in every sense of the word. The fast horse is the decoy—the object is to get money without a substantial equivalent. They lure as the highwayman often lures, for money, with this difference: the highwaymen don't run away with their victim's morals and steady habits. Then, too, what benefit is the fast horse to agriculture, to the arts, the sciences, and the general civilization of the age?—why call him in? Surely to call out a half drunken, brainless rabble, daily for a week at a stretch has any but a civilizing tendency. Yet baser still is the ample space given the fast horse, whilst all else is jammed into small space, and that space thronged by an idle-headed rabble, to the exclusion of all interchange of ideas, of those who go there to benefit and be benefited by the imparting of useful knowledge. The progress of the world is carried on the shoulders of those who probe for and impart useful ideas—the rabble float with currents, and if those currents are evil, their assemblage only gives those currents greater force. Therefore, to have a fair of worth, there should be no lure to call in the rabble. No premiums, every man his own judge, then no frauds to grumble at. Certain the great majority of exhibitors get no premiums, and if they can afford to exhibit without pay, surely those can

who have the best, for it is the best that the exhibit adds most value to, and it is a gambling principle to make the losers pay the winner. But let 500 persons of worth meet with ample space and time to compare their products, and a lasting good is the result; but what good can result from the yells of a rabble, as the fast horse drives by?

Then, again, what did those grand fairs of St. Paul and Minneapolis the past season cost the people in dollars and cents? Say a quarter of a million. And nearly the entire sum went into the pockets of fast-horse men and the managers of the fairs, the great agricultural interest only getting meagre offerings of reward, and those not all paid, showing conclusively that in the judgment of the managers those exhibits are strictly fast-horse carnivals, and the other interests only called in to give respectability and enhance the pile of plunder.

But let us see what the fast horse has done for agriculture, the arts, the sciences, and the civilization of former ages.

The first history we get of the fast horse is in Arabia, but that he had figured to the ruin of other nations at a more early date than we have record, and that his ruinous results were well understood as early as the time of Moses, is evident from the provision in the Jewish law, forbidding the use of the horse in the nation, and that by a general and profuse culture of fruit they soon rose from a horde of ignorant slaves to a great and prosperous nation, with no other speed than that of the slow, trudging donkey.

They grew their fruits in profusion, and as their fruits grew the people rose in morals and intelligence, and the nation prospered. But alas, for them! The wise King Solomon, in his pride, introduced the fast horse, and ere an age had sped, pride, ambition, and oppression caused the nation to burst into fragments. Yes, on the slow, trudging donkey they ascended the hill of fame, their pathway lined with the luscious fruit, free to all to gather and eat, but on the fast horse, with dazzling speed, with clouds of dust to mark their route as they rode down a rocky waste. And as they rode down happy, teeming millions dwindled, and by hunger pressed, as captives, they were driven to the four winds of heaven.

But during all that time the Arab's horse was never allowed to lag. Arabia was once noted for her balmy breezes, her vast fertile plains, her great wealth in agricultural products, with a population variously estimated by historians at from forty to one hundred millions; but on the fast horse down she has rode until her fertile lands are desert wastes, her balmy breezes mounted up to great desert storms, often burying whole caravans of slow-drudging, half-starved marauding thieves, now plodding over vast ruins at camel and donkey trudge.

But while mounted on the fast horse and power yet remained to scatter ruin around, they made conquests of other nations. Palestine and Asia Minor, the then guarded spot of the East, were first to fall to the fast horse and his rider, and to-day, like Arabia, their fertile plains are desert wastes, showing that at the tread of the fast horse fertile fields

turned into sand, and to match the breath of the riders, balmy breezes mounted up to great simoons—drifting desert storms. But not content, on sped the fast horse. Egypt in turn fell a prey, then a nation of forty millions, to-day less than four millions of half-starved, half-naked, brutal Arabs, with drifting sand where once were fertile fields. Thence on his ruinous tread, tramping to desert wastes the lands of rich and populous nations that lined the Mediterranean coast, extending hundreds of miles back, but to-day nearly the entire range compose a part of the great Sahara desert, dotted here and there by small tribes of degraded, poverty-stricken Arabs, whose ancestors, like those of all other desert-stricken lands of to-day, once fostered the fast horse to the neglect of all else, until so poverty-stricken that the slow donkey is a luxury but few can enjoy, and none but their kings and chiefs can mount a horse.

Nor did the sea form a barrier; over into Spain the fast horseman rode, then a nation of fifty millions, now less than ten millions, fostering nothing but the fast horse and internal revolutions. Though the Arab went no further, the fast horse did, and as a result France has had her upheavals, and more and greater looked for, England has had her internal dissensions, and only wants opportunity to give them motion. At home all her interests stand still to see the Derby races, whilst in her more distant provinces her oppressions know no mercy. She is a nation of merchants—the fast horse her idol, money her God, without soul or sympathy.

Nor did the wide ocean form a barrier; the fast horse is here, corrupting every source of society, and fostered above all else. The people of the land pay hundreds of thousands of dollars annually to see him run, the zeal growing at each repeat; and as the zeal rises and races multiply, depraved morals keep pace.

Nations are made up of communities, communities of families, and families of individuals; therefore, to make a great, prosperous nation, individuals, families and communities must be virtuous, cultivating peace at home and abroad. And the greatest of all incentives to peace at home is an abundant supply of the luxuries of life, and the most cherished fruit. But what award does it get at any of our popular horse races? or who stops to look at it, or any of the other good things, while the horses are running? Though fruit has its devotees, nationally it is only appreciated as a side show at a race track, to make horse racing respectable.

And as all interests are being pressed in to do homage to the fast horse, what is the drift of national morals? The Arabs had a national religion, and so have we, and in substance the same. The ruins of vast regions proclaim what theirs allowed, and let us see if the drift of our code forbodes a better ending. By government proclamation we have set days of thanksgiving, and of fasting and prayer, which stamps our nation as truly a religious nation as does the Arab's code. And as we have seen, the drifting desert storms proclaim the moral of his code. Let us take a survey of our nation's programme of rule.

We charter the foulest dens of vice, hot-beds of productive corruption, and then build prisons to coop the victims in that are decoyed and ruined by those same chartered dens. Yes, we charter men to spread ruin around, then take those ruined and degrade them still deeper in our foul prison cells.

Such as modern Christians make,
To reform a wayward brother;
Such as would make a devil quake,
Or its stench and filth would smother.

Our jails are horrible dens of torture, and our State prisons so many slave pens, where victims are compelled to labor for years, and often for life, without one cent of reward. Their labor made a source of State or national revenue, regardless of suffering families at home.

A like disgrace attaches to the drunkard and the prison convict, and alike the families of each lose caste and sympathy in society, and why? The chartered rum-seller ruins the reputation and morals, the court judge condemns to prison or to death. Therefore the disgrace attaches to the victims and their families alike, the ruin being all done by State officials—came of a corrupt source, and therefore disgraceful. But who put forth the tempting lure? The people did it. And to what end? To get revenue. And what that revenue costs, let us see.

To draw revenue from the dens, we annually sacrifice the happiness of a million of families; we donate 600,000 men for drunkards, 50,000 for murdered victims, 200,000 to fill prisons, 10,000 to fill insane asylums, and 500,000 more as paupers. The ruin all done officially, for which the people are responsible. And to all this ruin a disgrace attaches, and they who did it stand high in the respect of society, and simply for the reason that their calling is legal; but not so if the plunderer or assassin does the deed without a charter; then the disgrace attaches, not to the victim as in the other case, but to the one who committed the crime, as it should. But what is the moral of the nation? It is the letter of the law, and no matter how corrupt that law, the enormity of a crime is not a question; but was the act done legally, and if so, no blame attaches, no matter how base the deed; but if done illegally, no matter how humane and virtuous the act, you will find legal convict hunters on the track, for it is not crime that shocks communities and calls out our legal peace-makers. It is acts of illegality, as we shall demonstrate.

Take for instance the abuse of married women by their husbands. But few crimes of wife abuse are known to the law, and those few exceptions seldom come before the law venders, and simply for the reason that the penalty is so small, and so seldom enforced, that the outraged seldom ask redress, so hopeless such pleas. Wife abuse in a thousand forms is so common, that society feels but little sensation at the development of the most brutal of acts.

The moral is, the marriage ceremony gave the man the right to enforce his demands. Certain the majority of men take power and enforce it,

and allow it in others, and being of the law-making power, they attach no penalty, and allow of no sensation in society at such developments. But let a man do the same act to a neighbor's wife or daughter in good standing, for standing is everything, then society feels a shock, crime at taches. Therefore you see it is not crime that shock society, it is the offended dignity of the one assaulted, and a brutal man's wife is not supposed to have any dignity.

For anything that degrades or imputes the husband, degrades and robs the family of respect and sympathy.

And therefore to reform we must begin at the foundation of society and build upwards; and the foundations of society are individual family homes, and therefore, to reform, homes must be improved, attractions and luxuries more and better, and on, on, there can be no lag in a life partner, more and better as fast as circumstances will permit of—a lag in a life partner, as in a nation, to do its duty, is ever felt by all within its domain.

When a nation lags in its duty it is evident corruptions are traveling upward and that families and communities need remodeling. Negligence in life partners to provide all available comforts, is recklessness going to ruin, it is sweet homes changed to hells, wherein young devils are reared—national corruptions engendering. Negligence, or a lack of energy to provide for the tastes of a sweetheart, are unknown in any but a drone, and the moment they show in a home union, they are felt, love begins to wane, sweet homes savor of bitter, the neglected is less affable, one rebuff begets another, and so on, until sweet home is a wrangling hell, the progeny embittering society and the nation.

Though the luxuries of life or the efforts to obtain them, are essential to a sweet home, yet I admit their presence will not create a sweet home wherein two incongenialities are cooped, for in such a case it is a hell to begin with in its very nature, and the laws of nature are not susceptible of change. Such unions come of a corrupt source; a true union is being drawn together by affinity of affection, and lives by reciprocal favors. But many marry merely for a home, some for a housekeeper, some to please parents or esteemed friends, and many others with no other incentive than to hitch to one of the opposite sex, which in either case is nothing more nor less than prostitution in its most ruinous features. Without affinity all unions are prostitutions; legality can't change the nature of things, can't make natural prostitution a virtuous connection.

And such evil unions can only be remedied in the training, as peace and plenty endears the youth to the parent home.

For the past 1,500 years a true system of reform in human society has not been preached; the so-called reformers have overlooked the moral in their zeal to slide the life-lived sinner around the slippery shores of a deserving hell into an undeserved heaven. And as the slippery shores were passed morals took grade. Expediency dictated the customs of society, and made laws to fit. Hence such abortive morals in society that a man

may embrace a prostitute as a prostitute, and society feels no shock, nor a limb of the law be found on his trail, but let a man and woman, though ever so virtuous, start life together as man and wife without legal permit and society is shocked, and law venders are howling on their track. Was it for crime? No. Nature and society allow men and women to live together as man and wife. It was illegality—the letter of the law, that had not been complied with. But if she had been a regular chartered prostitute, and he a regular attendant at her den, no criminality would have attached, nor an outburst of public indignation been heard. And in no case does criminality attach to the man for lewd association. All indignation for such acts falls on the heads of erring women; the accomplice, the man, goes scot free, with no stain on his character in the estimation of society. But if the keeper of a lewd house has no charter, community feels a shock at its mention, the law leechers or a mob are called out to imprison, demolish or drive away. And what for? For keeping an illegal house, and nothing more; for if she had had a charter she would not have been disturbed, nor would society have felt a shock—certain a private brothel is no greater nuisance than a chartered one. And why heap the abuse and disgrace all on the woman's head, with the fact staring you in the face that the ruin of these women is the work of depraved men, that male depravity induced the opening of the house, and was its support after opened. But for so doing no indignant mob or law leechers are on his trail; he is pitied, petted, kissed and forgiven, whilst his participant is kicked, cursed and driven into deeper ruin.

If we would have female virtue undefiled, we must hold the man as strictly to virtuous life as the woman is held—determine the chief aggressor, and award accordingly. The erring woman of to-day is an outcast; the man that induced her to err is held blameless. Our code of virtue came from the Jews, theirs from the Arabs. The Arab woman is made to feel degradation in all its worst horrors—nakedness her fare, brutal flogging her training, the harem the extent of her acquaintance, with no other protector than her abuser, and with the Jews the erring woman was stoned, and whoremongers did it. Not one could be found exempt from adultery to throw the first stone, and what better the American moral and justice? An erring woman is turned out of church in disgrace, whilst he who wooed her into guile is retained as minister of that same church, and looked up to by the nation at large as the great protestant pope. And what the moral, we need be at no loss—a man will not allow in another what he has not the heart to do himself.

Male purity of our day is a theory only talked of; all see the need and preach it, hoping others may practice it. On that score we are a nation of theorists. All admit that like begets its like—can see how the chip came from the old block when a neighbor's child errs, but when a bad streak crops out at home, then a pious ejaculation: "Wondrous are the works of providence, and His ways past finding out—whom the Lord loveth he chasteneth." Thus shouldering all their fools, dwarfs and viciousness on their God, instead of owning up that they themselves and

others could apply a remedy. But, no; the father kicks his erring daughter out of doors for crimes that he bequeathed. All evils hang on the same string; one evil begets another, and it is on, on—no stopping point. Moral once let go is as a ship adrift on a wide sea, fancy forms his moral code, and he builds a heaven to suit his fancied needs; hence the nations' turmoils, thefts and slaughters, the thieves climbing up to heaven by the back way.

Hence it is that the murdered victims of rum sellers loom up to more than 50,000 annually in the United States alone, yet the nation feels no shock; no alarm is sounded; but let a band of unchartered raiders make a drive, as was done at Northfield, and the whole nation feels the shock; the alarm is sounded, and hundreds join in the pursuit, as money and sympathy are poured in to sooth the wife of the murdered victim. But had the chartered dram-selling assassins made the assault and done it in their usual way—struck a fatal blow, a lingering death of years, stolen his money, cut away self-respect, destroyed his character, drove his family into obscurity beyond the veil of sympathy, the kind messages and charities that saluted the ears of Mrs. Heywood would have been the wrangle of hard shells to get her children for cheap servants, and the rattle of an old rickety cart as she jostled over to the poor house. And the only shock that society would feel would be an additional two-mill tax on every \$10,000 to foot the bill.

So you see that from the American standpoint of morals, the crime at Northfield was not in the killing of Heywood, but in the off-handed manner in which it was done—done without license, and before the victim and his family had been disgraced.

Our laws are a mystified mass of riddles, solved only by experts in technical phrases, with jurors sworn that they are either knaves or fools, and the decisions in our courts frequently vie in enormity with the depredations of a band of Hottentots. The whole thing is a legerdmain of fraud, that nothing but a long purse can solve. Common sense and common justice measure crime according to the misery it produces, but not so the American standard. The question is not the enormity of the crime; but did the violator have a legal permit—a license? and if so, he is only guilty in the proportion as he violated the charter in the commission of the crime, and if found to have committed it strictly within the limits of the charter, then no criminality attaches; the legality strips the crime of all moral turpitude in the eyes of American morals and jurisprudence.

Legality, the letter of the law, is the highest criterion of morals known to our nation, as a nation, even to the wording of a damnable whisky license, the face of which is so heinous that no departure, though ever so abhorrent, can far transcend the face of the bill in enormity, and so treated by the law courts, no departure being deemed a very serious offense. Great God! what a shame! What a perverted state of morals and justice. And yet our rumsellers can boast of a thousand crimes to one

committed by highwaymen, yet the one crime shocks the world, while a thousand crimes a thousand times more heinous, scarcely produce a shudder, and why? The thousand are legal, the one illegal, committed without license. And yet, foul as are the demands of hell's venders, ruinous as are the results, the religion of the nation is willing to let this monstrous ruin go on—charter and re-charter, provided only that it will keep quiet on Sundays, and sing songs to the edification of the church-going throng. The church is master of the situation, has monopolized the moral teachings of the nation to the exclusion of all moralists, and for all abuses she is responsible. For ages the church has taught that no moral was pure, or its promulgator worthy of respect, unless a churchman, and accordingly all outside moralists were hooted down, not only by church men, but by those outside as well, showing that the church is master of the general mind outside of church, as well as within, and therefore wielding the helm of mind she is responsible for all abortions in society.

The religion of the nation not only allowed slavery, but defended it as a divine institution, and since the death of the system as a military necessity, more than 30,000 have been murdered, the moral justice of the nation excusing and forgiving the perpetrators without a pardon being asked. The North, too, in the time guilty of robbery and murder equally as revolting by the slaughter and plunder of Indian tribes. So bold and relentless the robberies and murders, North and South, that it can be said of a truth: "That on the side of the oppressor there is power, and the poor have none to help."

In the South the extermination of the Negro race is boldly advanced, on the ground that freedom has spoiled them. And in the North the extermination of the Indian race is boldly urged, on the ground that with them civilization is a failure. But what have been the civilizing agencies sent to the Indians other than frauds, cheats and whoremongers, with whisky, beads and tobacco, and the dealing of the nation is to drive them from their lands from time to time to those of less worth.

That the churches have sent ministers amongst them I do not dispute, but water can not rise higher than its fountain, nor will morals rise higher than precept and example. The example is fraud, theft, adultery and murder. Arab religion to the letter, the precepts being the same that have deluged the world in blood for the last 1,500 years. And that it is a depraved code the turmoil of the last 1500 years stands a bloody witness. In that lapse of time the creed has swayed the world. Prior to that time the code had but few adherents save in Arabia. Though we do not have our pilgrimages to Mecca, as do the Arabs, we have our set days for fasting and thanksgivings, and for the same end, to take an appeal from injured man to God, and the routine to obtain the pardon is the same as that of the Arabs and that upon which the God of Isaiah blew his indignation.

And who shall demand that I shall respect what the God of Isaiah hated 3,000 years ago. Let us hear him:

Isaiah i., 3-15.—“When ye come to appear before me who has required this at your hands to tread my courts. Bring no more vain oblations—incense is an abomination unto me, the new moons and Sabbaths, the calling of assemblies. I cannot, away with it, it is iniquity even the solemn meeting. Your new moons and appointed feasts my soul hateth. They are a trouble unto me. I am weary to bear them. And when ye spread forth your hands, I will hide mine eyes from you; yea, when ye make many prayers I will not hear. Your hands are full of blood.”

The rehearse is sweeping, including every syllable of modern piety. It was full of blood then, and its counterpart is full of blood to-day. The God of the prophet has told us how he hated their appeal from injured man to him, and now let us hear what he held to be their duty in the next two verses. “Wash you, make you clean, put away the evil of your doings from before mine eyes; cease to do evil, learn to do well, seek judgment, relieve the oppressed, judge the fatherless, plead for the widows.” Here we have man’s duty summed up, instead of a bankrupt appeal, and in that moral code there is no fraud, no steals, no slaughter, nor a shadow of a God-forgiving religion.

Or in other words the whole duty of man is to man to do to others as we would they should do to us, and anything more is a fraud in the judgment of Jesus Christ and the God of the Prophet, and that same fraud is the code taught the Indian, and how it has taken, the loss of native moral, and the taking on of vices, prostitution, theft and drunkenness, tell the extent of its adoption. The excesses with them as with us is only a slopping over.

The fact is, an attempt to civilize the Indians has never been made, the fruit grower and farmer with seeds, trees and vines—the luxuries of life, and the only civilizing elements of society, have not been sent among them.

Civilization with the great mass of our nation is as truly a failure as it is with the Indian, and what little civilization we have owes nothing to the creeds; not a reform for the last 1500 years but what has had to run a church gauntlet, pelted by all the piety of the land, and the reform only adopted, as the outside world laughed them to shame, and then not adopted as essentials, but merely as church ornaments.

The great essential is in the appeal, as we have seen, and as I contemplate, my soul sickens, my blood chills at the enormity of the delusion and its results. A creed that has a sail for every breeze, a passport to every folly, a balm to every lust, a chart to every crime—a delusion the origin of which is a wonder, the God of the Prophet denies being author.

Then he loathed and hated it—its hands were full of blood, and nearly a thousand years later the same psalm singing, public praying, God-forgiving religion confronted Jesus of Nazareth, who termed its worshippers serpents, hypocrites, whited sepulchers full of dead men’s bones, who devour widows’ homes, and for a pretense make long prayers to be heard of men—thieves climbing into heaven by some other way than the door—a generation of vipers deserving the damnation of hell, and yet in their

zeal would compass sea and land to make a proselyte, and when made, two-fold more the child of hell than themselves. And so it is to-day; the converted Indian slops over in depravity more than his exemplary teacher—you know new converts always go it strong.

An honest man enters by the door, a thief clambers in some other way; and so it is with the man who feels that his duty to his fellow man has been done; a peace within tells him that all is well, and so feeling he passes to the evergreen shores through an open doorway of a good conscience, but not so with the nation's pious; they take an appeal to the court, the murderous Arab courts, as corrupt as their diabolical deeds. I cannot say to Heaven's court, although they claim, for theirs is a court before which the shivering of the naked, the cries of the starving, the grief of the slandered, the groans of the dying, and the blood of their murdered victims, are not allowed against them in the appealed suit, nor as a charge for an after hearing. Yes, they sing and pray themselves around the shores of an admitted undeserved heaven—thieves climbing up. another way as truly as was done 1800 years ago. With this addition to-day, that in the appeal prayer guilt is admitted—base crime, crime deserving damnation a thousand times over, and the only claim for mercy is cowardice—not the courage to face just retribution. Yet this same creed claims to be the true reformatory element of the world with the same tenacity and boldness with which its prototype confronted Jesus Christ, who termed its votaries whited sepulchres full of dead men's bones.

In the prophets' day their hands were full of blood; in Christ's day they devoured widows' homes, but in our day, aside from the plunder and slaughter of defenseless Indians and negroes with whisky and tobacco, degradations unknown to the ancients, the souls, the life promptings of millions are destroyed. Yes, the ruling moral of the nation allows the luxuries of life to be converted into elements of degrading ruin, and then charter men to deal the ruin out, whilst the millions pine with hunger that the waste would have supplied. To reform we must inaugurate the moral that the whole duty of man is to man—a moral that will save the waste, and by saving stop the ruin the waste makes; and not only save the waste, but grow more and better, until the cry of hunger is heard no more.

The individual man is composed of a multitude of members, which a neglect of either may endanger the health or the life of the whole, and so it is with the human family, each one a part of the individual whole; the ruin of any part in time is sure to bring ruin to the whole. So it has been from the earliest data down, and the programme of to-day is the programme of the past, the only gain, the gain of vices. Nothing is a gain that does not add comfort to the needy.

All great nations that have rose and fallen, rose on the virtue of the masses, and fell by the weight of their depravities, the fall dating from the time that monopolies began to revel in superabundance, while the masses pined with hunger.

Thus it always has been, the order of society ever the same, and with that order the results could not be otherwise, and it now devolves on us to say what shall be the future, whether the waste of luxuries and of morals shall go on, or that waste stop, and more and better be given to the full of all needs.

Certain nothing less will do if we would have true civilization advance. Individual persons and individual nations have made strides forward, but in the process of time their standstill surroundings drew them back again. A snake may stretch, but can't advance without bringing up its tail, and so with the human race, so nearly one, that no one can be left out in a successful forward march.

The whole planetary system moves in harmony, the motion of each helping to move the others, and to knock one out would be to throw the whole into one mass of ruin, and so runs the history of mankind—a lesson a thousand times taught but never heeded, the tumblings and bumpings going on as heedless as if ruin never had befallen men or nations. Philanthropists have dotted all ages, but ever too unpopular to sway the masses, it is creeds that have swayed and run the world, all closely akin, each grasped for power, each swayed a bloody sceptre, each rose as crushed victims were piled beneath them, and each fell as the rotten mass swallowed them up, and to-day the rotten mass is an open-mouthed vault, and its prey certain.

The Arab was first that we have data, to mount the fast horse, and with songs and prayers and great zeal, has rode down a few ages ahead of us, but as fast as speed can carry, with the same routine we, as a nation, are after him, with a supply of whiskey and tobacco that will carry us below and beyond where any depravity of his could damn him, and all that can save us is a firm stand on a true moral, that to be prosperous is to be at peace, and to be at peace is to have the needs of all supplied, the goodly things grown in profusion, every available roadside should be set with fruit bearing trees and vines, free for all to gather and eat. To civilize we must make the waste places glad, the deserts to bloom, with none to molest or make afraid—each enjoying the fruits of his own labor.

But why the world is where it is, is evident, desolating zealots have dotted all ages with their ruin, and desolate it yet, the most oppressive rule at this age being that of Great Britain in her conquered provinces, breeding famine and pestilence, twice set cholera over the world, and a third time in motion, to ruin again wherever debauchery and poverty furnish victims.

To-day Great Britain is a fast horse nation, all else stands still to see the Derby races and as zealously pious as is the Arab, and as with the Arab, where'er she rides, war, pestilence, famine and death follow in her wake, with the point of the sword she stuffs her religion down tender stomachs, at the cannon's mouth, opium and rum included, with the Bible on top to keep all down, and as a natural result where'er she lets off loading the land puffs with pride, groans oppression, and sinks with

debauchery. And the same can be said of America, our poverty and debauchery breeds pestilence, as our general corruptions multiply insect enemies, in number and kinds, curse everything with blight, mildew, or rot. As a nation we are robbing the poor of the goodly things of life, the earth partaking of the nation's greed cuts short the yield, so that with one or two exceptions our farm crops for the last 18 years have been gradually growing less per acre, new lands not yielding what new lands did 20 years ago—seasons varying to suit the quiet or turmoil of the nation—hence the gain of the last two years, 1878-79.

The boisterous weather of two years ago calmed with the political quiet, and the two yet hold together, storms rising in fury as the political excitement rises in passion, showing that a great excitement that sways any considerable portion of the world's people gives form and character to the weather, as well attested facts prove. The winter Washington lay at Valley Forge was the coldest known to that date, and not repeated until the winter Charleston was besieged during the rebellion. And the winter Charles XII invaded Russia, they had the hardest winter known there up to that date, and not repeated until the invasion of Napoleon and the burning of Moscow. Then again during the French revolution of 1792 and '93 the hardest winter occurred ever known in France to that date, and not repeated until the winter Paris was besieged by the Germans.

And so run the historic events of the world, human quiet or commotion giving form to the elements. Hence earthquakes, eruptions and great tornadoes sweep over space, as great secret conclaves contemplate setting their forces in motion.

Therefore, let him that readeth understand, that when he hears of great storms sweeping from the gulf northward, that it is the elements revealing secrets.

In America the results of the fast horse are telling in corruptions and dissensions, the nation's foot has made one slip, and pour the blood of a wholesale Indian and negro slaughter on the slide, and like an avalanche let go at the mountain's height, will go crashing beyond and below where any ignorance or depravity of Negro or Indian could sink them.

As a nation we are traveling the same high road the Arab went, and where he has gone we are going. He to-day is the most brutal being that lives—rode down there on the fast horse—and our nation with the same speed is going down the descent, with whisky and tobacco, foul curses unknown to the Arab, to sink us lower and curse us more lasting.

And now, in conclusion, let me entreat one and all to scan well the evils that confront us—probe for a cause and the remedy.

For the last fifteen hundred years the so-called reformers have preached peace; "Do to others as you would they should do to you; forgive your enemies; do good to those that persecute you; bless them that hate you,"—with hands dripping in blood the while; and should a converted Indian slop over a little strong, with teeth set you will hear them ejaculate: Exterminate the race; Christian civilization with them is a failure.

But not so 1800 years ago. The followers of Christ preached peace, and practiced what they preached—had neither rich nor poor amongst them—all fared alike. They cultivated peace at home and with the world around, so that in the midst of the rush and wreck of nations that then transpired, they lived unharmed, alike respected by the victors and the vanquished. Then it was hard for a rich man to enter heaven, he had to sell all and divide with the poor, content to live a common equal. But nowadays Christians retain their wealth, and climb up to heaven another way, and as they ascend the scaling ladders with songs and thanks to God for their full and over-burdened storehouses of acknowledged ill-gotten gains, the poor cry for bread and shiver with cold right under the eaves of their costly churches, and all the relief, old clothes, rancid butter, mouldy cheese, little potatoes, hogs' jowls and shank bones are turned over to the soup hovel to feast the poor on swill and rich men's prayers. The God of Malachi having smelled in the solemn meetings of that day, termed their exercises "dung," and were he to smell in the churches of to-day, he would tell them that their charities were not fit to make dung of. Yet the same song of peace and good will to man to man is being sung to-day that was sung 1800 years ago—commingling as they rise to heaven with the cries of the starving and the groans of murdered Indians and Negroes.

Evidently the creeds of to-day are not reformers; the morals, the peace and purity of the world is suffering in their keeping. They have had an uninterrupted rule of over 1500 years; their bloody record is before us. their foul prisons and foul dens of chartered vice bedot the land—stinking curses of the race, so that you see stamped in the faces of half the men you meet, rogue or whore-monger, if indeed he is not too drunk to look up. Naught but true principles will do. What created quiet and commanded respect 1800 years ago would have the same power to-day, if carried out, and to that end let us urge the putting of a large supply of the luxuries of life in the reach of all, and to make the blessing more complete and lasting urge the growing of more and better fruit. For, be it remembered, the earth is stingy or benevolent as we set the example, and that as we give the deserts will bloom, and the waste places with luscious fruit make glad all hearts. But the Arab's horse will only sink us deeper and curse us more lastingly.

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ERRATA.

Page 11—for "1883" read "1882".

Page 123, line 30—for "walls" read "males"; line 40—for "of tree" read "after the".

Page 136, line 25, read as follows: "Mr. Poole, James Currant Cuttings," etc.



